MATHS MELA

Textbook of Mathematics for Grade 5

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NCERT

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Foreword

The Foundational Stage in school education, as envisaged by the National Education Policy (NEP) 2020, serves as the cornerstone for the holistic development of children. It enables them not only to imbibe the invaluable samskaras rooted in our country's ethos and constitutional framework, but also to acquire basic literacy and numeracy. This foundation equips them to transition seamlessly into the more challenging Preparatory Stage.

The Preparatory Stage acts as a bridge between the Foundational and the Middle Stages, spanning three years from Grade 3 to Grade 5. The education provided during this stage builds upon the pedagogical approaches of the Foundational Stage. While the play-way, discovery, and activity-based learning methods continue, children are also introduced to textbooks and more formal classroom settings. This introduction aims not to overwhelm but to establish a foundation across curricular areas, promoting holistic learning and self-exploration through reading, writing, speaking, drawing, singing, and playing. This comprehensive approach encompasses physical education, art education, environmental education, languages, mathematics, basic science, and social science. This comprehensive approach ensures children are well-prepared both at the cognitive, sensitive, physical, and *pranic* (emotional) levels to effortlessly transition to the Middle Stage.

The textbook, *Maths Mela* for Grade 5 Mathematics is meticulously designed to align with these objectives. It adheres to the recommendations of the National Education Policy 2020 and the National Curriculum Framework for School Education 2023. The textbook emphasises conceptual understanding, critical thinking, creativity, values, and dispositions essential for this developmental stage. It incorporates cross-cutting themes such as inclusion, multilingualism, gender equality, and cultural rootedness integrating appropriate ICT and school-based assessments. The engaging content and activities are designed to captivate students and encourage peer group learning, thus enriching the educational experience for students as well as teachers.

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It is crucial to remember the pedagogical focus of the textbook emphasising understanding, critical thinking, reasoning, and decision making. Children's innate curiosity at this stage should be nurtured by addressing their questions and designing activities based on core learning principles. While the play-way method continues, the nature of toys and games used for teaching evolves to enhance engagement rather than mere attraction.

While this textbook is valuable, children should also explore additional resources on the subject. School libraries should facilitate this extended learning, and parents and teachers should support their endeavours.

An effective learning environment motivates students, keeping them engaged and fostering curiosity and wonder vital for learning.

With confidence, I recommend this textbook to all students and teachers at the Preparatory Stage. I extend my gratitude to everyone involved in its development, hopeful that it will meet expectations. As NCERT remains committed to systemic reforms and improving publication quality, we welcome feedback to refine the textbook content.

DINESH PRASAD SAKLANI
Director
National Council of Educational
Research and Training

New Delhi
23 June 2025

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About the Book

The textbook *Maths Mela* for Grade 5, has been developed based on the recent documents—National Education Policy (NEP) 2020 and National Curriculum Framework for School Education (NCF-SE) 2023. They aim to ensure that all children achieve basic numerical skills and abilities to think mathematically and logically, solve problems, develop intuitions regarding quantities and reasoning, and feel a sense of joy, wonder, and curiosity. The Preparatory Stage specifically focuses on the development of conceptual ideas about numbers, shapes, and spatial relationships, measurement and data handling, procedural skills and fluency, and computational thinking.

In light of this, the book for Grade 5 is designed to support learners in consolidating their learnings in the Foundational Stage and making progress towards dealing with more abstract ideas. The chapters of the book cover the foundational ideas of Mathematics: whole numbers and operations, fractions, shapes and spatial relationships, measurement (length, weight, capacity, time), and data handling. Chapters are woven around certain themes so as to engage children with the ideas and their applications. Ideas will keep recurring throughout the book, building deeper engagement and complexity to suit the interest and curiosity of the growing child.

We firmly believe that young learners are capable of reasoning, thinking, and problem-solving in different ways. Therefore, the book provides several occasions for identifying and noticing ideas and relationships across ideas, giving examples and counter-examples to statements, creating objects using mathematical ideas, measuring and quantifying, estimating, and solving problems. There are also opportunities to hone one's arithmetic skills through bare exercises, games, and puzzles. At some places in the chapters, such opportunities have been provided under the section 'Let us Play'. Another important purpose behind games and puzzles is to provide learners a stress-free and joyful learning. Most of these need not be assessed. Some tasks are aimed towards 'computational thinking' where learners are expected to observe and articulate patterns and find exhaustive solutions and solutions under different constraints.

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We also believe that learners should develop a liking for Mathematics. The chapters of this textbook provide several enjoyable activities, tasks, games, and puzzles that build on children's intuitions and tap into their experiences in the world around them. These have been given under the section 'Let Us Do' at many places in the chapters. These are sometimes used for making an entry to the concept and at other times provide opportunities to consolidate the ideas. The narrative in the chapters is supported through vivid illustrations, which are also integral to the tasks. We hope that this will allow learners to read pictures and use them for developing important mathematical ideas. Mathematical vocabulary and ways of communicating about mathematics have been emphsised throughout the chapters. We continue to provide instructions and explanation with as little use of language as possible.

Mathematics is an integrated body of knowledge, with a connected and coherent set of ideas. It can be built logically on commonly shared assumptions. Mathematical thinking and reasoning are an important part of learning mathematics. The book attempts to move away from rote memorisation of rules and procedures which kill learners' curiosity and burden them. It rather pushes learners to explore and discover important mathematical ideas. The sections named 'Let Us Think', 'Let Us Explore', and 'Let Us Discuss', included at various places, aim at keeping learners curious to reason out their thinking. These will give them reasons and insights that can be used to remember ideas and apply ideas flexibly and creatively, making further learning easier. It is important to engage with these processes of Mathematics so that learners can go beyond routine mathematical problems confidently and without fear and anxiety. We hope that the carefully chosen learning activities will help them make sense of the ideas, develop capacities to solve problems, experience wonder and joy in the process, and be curious about the world of mathematics. In addition to all of these, with growing capacities of children we have introduced a section called "Let Us Solve". This is aimed to help children hone their skills of using procedures, solving routine problems, and word problems.

We believe that the time available for children to work on problems and share their solutions and ideas will be crucial to achieve the objectives of NEP 2020 and NCF-SE 2023. The book carries several suggestions for appropriate activities and experiences (in class and in and around the home) to develop mathematical ideas.

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Teachers' and parents' support in changing conditions of learning for our children will be very important to achieve the dreams of a better and more confident nation.

The book also advises on the making of simple inexpensive concrete materials for learners to work with, and to develop and communicate their thinking. A few perforated sheets for some of the tasks in the chapters are provided at the end of the book. There are some more ideas in the 'Note for the Teachers' for activities and materials. The chapters also show a gradual movement from the use of materials to the use of pictures and making schematic diagrams to make sense of the situation and identify better strategy. The book tries to build models for the ideas using materials and pictures so that learners can use them to develop independent thinking. We would sincerely urge teachers and parents to use the sequence of ideas suggested in the book for teaching and gradually arrive at more formal rules and procedures. When children develop a better understanding, they will be in a better position to appreciate the rules and procedures. Similar care is also to be taken by parents and elder siblings who may help their wards in learning through this book. 'Note for the Teachers' may help teachers and parents in appropriately enhancing the child's learning.

Several activities and tasks in the book also require that children talk and discuss their ideas. Learning will significantly improve in a classroom that welcomes and respects learners' ideas. They will see different ways of thinking and using ideas, and alternative solutions leading to better and independent solutions over a period of time. They will get opportunities to scrutinise each other's solutions and develop fluency with mathematical language, symbols, and procedures. These will also serve as good assessments of learning for the teacher and also provide feedback to them. The exercises given in the book are also examples of how learners can be assessed.

Assessment should be done in multiple forms—using materials and pictures, problem situations and bare problems, activities, creating objects, and sharing and explaining solutions. The book provides enough opportunities for adaptive assessment, assessment for learning, and assessment as learning while the child is engaged in different activities. Teachers can note down their observations while the learners discuss their ideas, replying to the questions asked, and explaining the reasoning for their answer. Such records can be included in the learner's portfolio.

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Chapters have more paper and pen tasks in Grade 5 (questions, word problems, and projects) that a child can complete in the classroom or at home. Such tasks provide opportunities to practice writing and present their thinking on paper.

In the times to come, we will provide more resources to the teachers and learners in the form of videos, worksheets for practice, and links to online resources.

We hope that the book will be enjoyable to all and will lead to better teaching-learning conditions.

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THE CONSTITUTION OF INDIA

PREAMBLE

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a [1]**[SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC]** and to secure to all its citizens :

JUSTICE, social, economic and political;

LIBERTY of thought, expression, belief, faith and worship;

EQUALITY of status and of opportunity; and to promote among them all

FRATERNITY assuring the dignity of the individual and the [2][unity and integrity of the Nation];

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949 do **HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.**

---

1. Subs. by the Constitution (Forty-second Amendment) Act, 1976, Sec.2, for "Sovereign Democratic Republic" (w.e.f. 3.1.1977)
2. Subs. by the Constitution (Forty-second Amendment) Act, 1976, Sec.2, for "Unity of the Nation" (w.e.f. 3.1.1977)

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Constitution of India

Part IV A (Article 51 A)

Fundamental Duties

It shall be the duty of every citizen of India —

(a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;

(b) to cherish and follow the noble ideals which inspired our national struggle for freedom;

(c) to uphold and protect the sovereignty, unity and integrity of India;

(d) to defend the country and render national service when called upon to do so;

(e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;

(f) to value and preserve the rich heritage of our composite culture;

(g) to protect and improve the natural environment including forests, lakes, rivers, and wildlife, and to have compassion for living creatures;

(h) to develop the scientific temper, humanism and the spirit of inquiry and reform;

(i) to safeguard public property and to abjure violence;

(j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement;

*(k) who is a parent or guardian, to provide opportunities for education to his child or, as the case may be, ward between the age of six and fourteen years.

Note: The Article 51A containing Fundamental Duties was inserted by the Constitution (42nd Amendment) Act, 1976 S.11 (with effect from 3 January 1977).

*(k) was inserted by the Constitution (86th Amendment) Act, 2002 S.4 (with effect from 1 April 2010).

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CONSTITUTION OF INDIA

Part III (Articles 12 – 35)
(Subject to certain conditions, some exceptions
and reasonable restrictions)

guarantees these

Fundamental Rights

Right to Equality

- before law and equal protection of laws;
- irrespective of religion, race, caste, sex or place of birth;
- of opportunity in public employment;
- by abolition of untouchability and titles.

Right to Freedom

- of expression, assembly, association, movement, residence and profession;
- of certain protections in respect of conviction for offences;
- of protection of life and personal liberty;
- of free and compulsory education for children between the age of six and fourteen years;
- of protection against arrest and detention in certain cases.

Right against Exploitation

- for prohibition of traffic in human beings and forced labour;
- for prohibition of employment of children in hazardous jobs.

Right to Freedom of Religion

- freedom of conscience and free profession, practice and propagation of religion;
- freedom to manage religious affairs;
- freedom as to payment of taxes for promotion of any particular religion;
- freedom as to attendance at religious instruction or religious worship in certain educational institutions.

Cultural and Educational Rights

- for protection of interests of minorities;
- for minorities to establish and administer educational institutions;
- saving of certain Laws 31A–31D.

Right to Constitutional Remedies

- by issuance of directions or orders or writs by the Supreme Court and High Courts for enforcement of these Fundamental Rights.

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Gandhiji's Talisman

I will give you a talisman. Whenever you are in doubt or when the self becomes too much with you, apply the following test:

Recall the face of the poorest and the weakest man whom you may have seen and ask yourself if the step you contemplate is going to be of any use to him. Will he gain anything by it? Will it restore him to a control over his own life and destiny? In other words, will it lead to Swaraj for the hungry and spiritually starving millions?

Then you will find your doubts and your self melting away.

Chapter 1

We the Travellers—I

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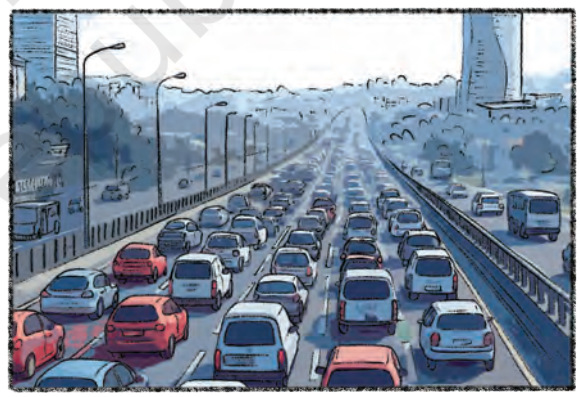
When was the last time you went on a long trip? Where did you go? How did you travel? What was the duration of your trip? How much distance did you cover? Ask the elders who went with you to help you answer these questions.

Human beings have always been interested in travelling. About a hundred years ago, there were far fewer vehicles than today. There were animal-drawn carts, cars, and trains. Long before this, thousands of years ago, people travelled long distances on foot or used animals to travel from one place to another. They also built boats and ships to travel across lakes, rivers, and seas. Boats were probably the first form of transport invented by humans, much before bullock carts! Do you know how many vehicles are currently there in your state?



Reading and writing large numbers

How do you write numbers to show several thousand objects?

Let us start with 1,000. What numbers do we get when we keep adding a thousand?

1,000	2,000							9,000

What number do we get when we add a thousand to 9,000? We get **ten thousand**. How do we write this number?

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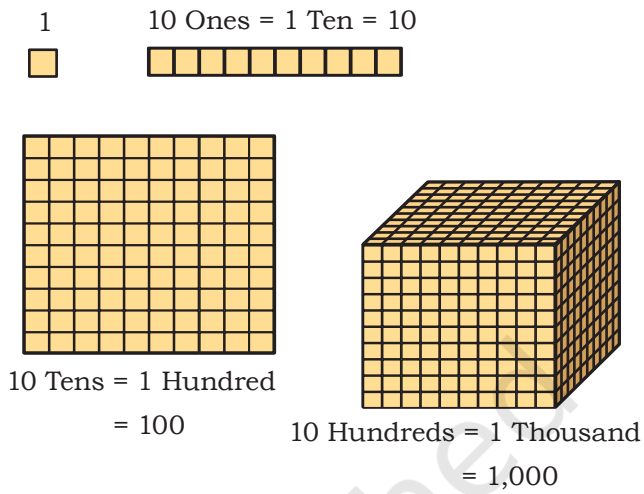
Look at the table below and notice the pattern of writing numbers. In the place value chart, we have added another column, **TTh**. It stands for ten thousand.

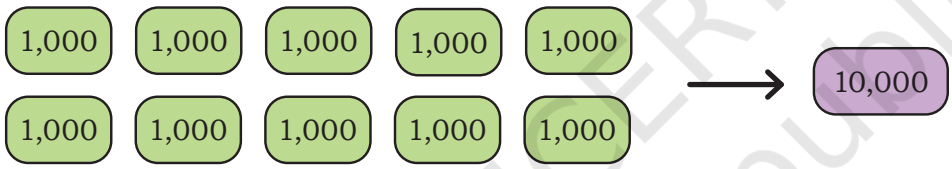
×10 ×10 ×10 ×10

TTh	Th	H	T	O
				1
			1	0
		1	0	0
	1	0	0	0
1	0	0	0	0



In the same way, 10 Thousands = Ten Thousand = 10,000

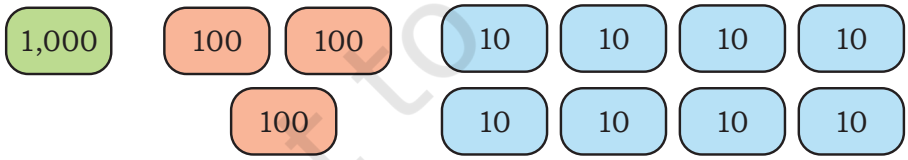
We use a comma to help us read large numbers easily



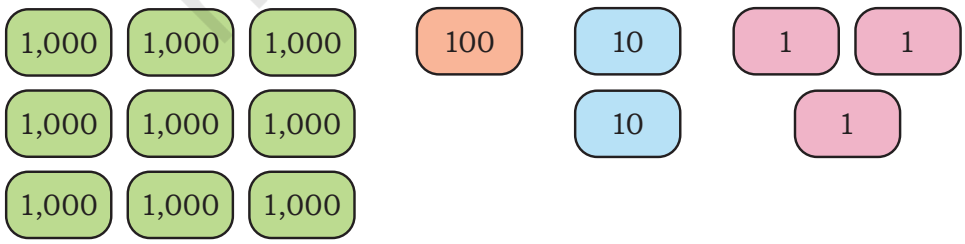
Do you remember how we read and write numbers in the Indian place value system? We use the same ten digits 0–9 in different places to write larger numbers.

For example,

1,380 = 1 Thousand + 3 Hundreds + 8 Tens + 0 Ones.



9,123 = 9 Thousands + 1 Hundred + 2 Tens + 3 Ones.



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Let us see how we write numbers beyond 10,000 and how we name them. We write them in the same way as numbers below 9,999. You can use the tokens given in the end of the book.

Token(s)	Number	TTh	Th	H	T	O	Number Name
10,000 1	10,001	1	0	0	0	1	Ten thousand one
10,000 1 1	10,002	1	0	0	0	2	Ten thousand two
10,000 10	10,010	1	0	0	1	0	Ten thousand ten
10,000 10 10 1 1 1 1	10,024	1	0	0	2	4	Ten thousand twenty-four
10,000 10 10 10 1 1 1							Ten thousand thirty-three
10,000 100 100 100 100 10 10 10 10 10 1 1 1 1 1 1 1	10,458						Ten thousand four hundred fifty-eight

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Token(s)	Number	TTh	Th	H	T	O	Number Name
10,000 1,000 100 100 10 1 1 1 1		1	1	2	1	4	
10,000 1,000 1,000 1,000 100 100 100 100 100 10 10	13,520						Thirteen thousand five hundred twenty
10,000 10,000	20,000						Twenty thousand
10,000 10,000 10,000 10,000 1,000 1,000 1,000 1,000 1,000 100 100 100 100 100 100 100 100 10 10 10 10 10 10 1 1 1 1 1 1 1	45,867						Forty-five thousand eight hundred sixty-seven

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Let Us Do

1. Fill in the blanks by continuing the pattern in each of the following sequences. Discuss the patterns in class.

(a) 456 → 567 → 678 → ☐ → ☐ → ☐ → ☐

(b) 1,050 → ☐ → 3,150 → 4,200 → ☐ → ☐ → ☐

(c) 5,501 → 6,401 → 7,301 → ☐ → ☐ → ☐ → ☐

(d) 10,100 → 10,200 → 10,300 → ☐ → ☐ → ☐ → ☐ → ☐ → 10,900 → ☐

(e) 10,105 → 10,125 → ☐ → ☐ → ☐ → ☐ → ☐ → ☐ → ☐

(f) 10,992 → 10,993 → ☐ → ☐ → ☐ → ☐ → ☐ → ☐ → ☐

(g) 10,794 → 10,796 → 10,798 → ☐ → ☐ → ☐ → ☐ → ☐ → ☐

(h) 73,005 → 72,004 → ☐ → ☐ → ☐ → ☐ → ☐ → ☐ → ☐

(i) 82,350 → 83,350 → ☐ → ☐ → ☐ → ☐ → ☐ → ☐ → ☐

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2. Fill in the blanks appropriately. Use commas as required.

Number	Number Name
8,045	Eight thousand forty-five
7,209	
10,599	
	Ten thousand seven hundred forty-three
20,869	Twenty thousand eight hundred sixty-nine
13,579	
	Ten thousand ten
	Fifty-six thousand four hundred ninety-one
45,045	
39,593	
50,005	
26,050	
81,200	
	Ninety thousand nine
	Twenty-three thousand two hundred thirty
	Thirty-six thousand one

3. Arrange the numbers below in increasing order. You can use the number line below, if required.

40,347 | 34,407 | 40,473 | 34,740 | 73,404 | 74,430 | 47,340 | 18,926

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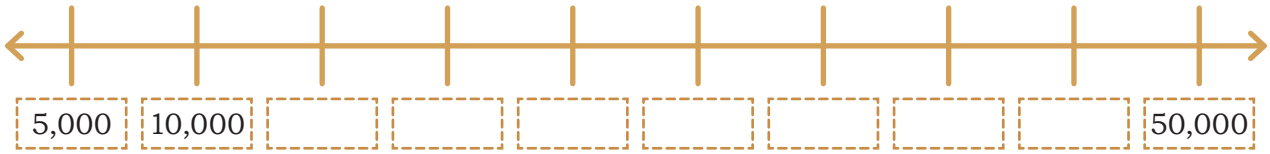
4. A student said 9,990 is greater than 49,014 because 9 is greater than 4. Is the student correct? Why or why not?

Use the number line below to find the position of the numbers. Fill in the blanks.



TTh	Th	H	T	O
	9	9	9	0
4	9	0	1	4

You can use this place value chart to compare the numbers.

5. Digit swap

(a) In the number 1,478, interchanging the digits 7 and 4 gives 1,748. Now, interchange any two digits in the number 1,478 to make a number that is larger than 5,500

(b) Interchange two digits of 10,593 to make a number

i) Between 11,000 and 15,000.

ii) More than 35,000.

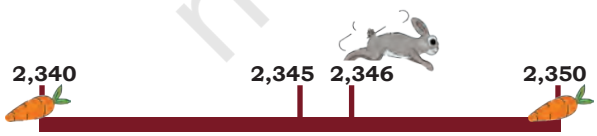
(c) Interchange two digits of 48,247 to make a number

i) As small as possible.

ii) As big as possible.

Nearest Tens (10s), Hundreds (100s), and Thousands (1,000s)

A rabbit is hungry. Its location is given in the pictures below. Its food has been kept at two places. Help the rabbit to reach its food.



The rabbit is at 2,346. Its food has been kept at its neighbouring tens. On which tens should the rabbit go to get its food, with the least number of steps.

2,350 is the nearest ten of 2,346. It will need 4 jumps to reach 2,350.

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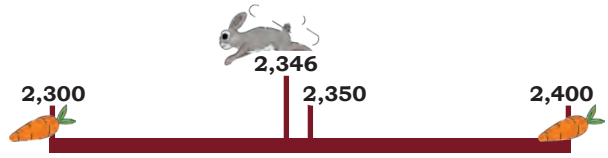
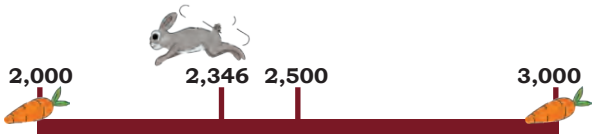
The rabbit is at 2,346. Its food has been kept at its neighbouring hundreds. Which of the two hundreds should the rabbit go to?

_____ is the nearest hundred of 2,346. It will need_____ jumps to reach _____.





The rabbit is at 2,346. Its food has been kept at its neighbouring thousands. Which number should the rabbit go to?

_____ is the nearest thousand of 2,346. It will need _____ jumps to reach _____.

Fill in the boxes appropriately.

Number	Nearest Tens	Nearest Hundreds	Nearest Thousands
3,176			
4,017			
5,789			
8,203			

Let Us Think

1. Vijay rounded off a number to the nearest hundred. Suma rounded off the same number to the nearest thousand. Both got the same result. Circle the numbers they might have used.

   7,126 7,835 7,030 6,999

Note for Teachers: Help the learners notice the placement of numbers in the neighbouring range of tens, hundreds, and thousands. Encourage them to use such images till they get comfortable identifying the nearest ten, hundred, and thousand.

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2. Think and write two numbers that have the same—

   (a) Nearest ten.
   (b) Nearest hundred.
   (c) Nearest thousand.

For example, 19 and 21 have the same nearest ten, that is, 20.

3. Think and write the numbers that have the same—

   (a) Nearest ten and nearest hundred.
   (b) Nearest hundred and nearest thousand.
   (c) Nearest ten, hundred and thousand.

Travelling, Now and Then

We learnt that people in the past travelled on foot, on animals, and used boats and sailing ships. The animals that have been used for travelling include bullocks, horses, donkeys, mules, and elephants. In hilly and snow-covered regions, yaks, dogs, and reindeers have been used, while camels have been used in deserts.

Now, people use bicycles, motorbikes, cars, buses, trains, ships, and aeroplanes to travel from one place to another. Submarines are used to go deep under water. Humans are also using spacecraft to travel to outer space.

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In an hour a person can generally travel—

(a) 3–5 km on foot.
(b) 10–15 km on horseback.
(c) 12–20 km by cycle.
(d) 40–60 km by motorbike.
(e) 40–160 km by train.
(f) 25–45 km by ship.
(g) 750–920 km by aircraft.
(h) minimum 28,000 km by spacecraft.

Let Us Do

1. A cyclist can cover 15 km in one hour. How much distance will she cover in 4 hours, if she maintains the same speed?

2. A school has 461 girls and 439 boys. How many vehicles are needed for all of them to go on a trip using the following modes of travel?

   The numbers in the bracket indicates the number of people that can travel in one vehicle.

   (a) Bicycle (2)
   (b) Autorickshaw (3)
   (c) Car (4)
   (d) Big car (6)
   (e) Tempo traveller (10)
   (f) Boat (20)
   (g) Minibus (25)
   (h) Aeroplane (180)

Finding Large Numbers Around Us

We saw that the distance (in kilometre) covered by different means of transport in an hour can range from a 1-digit number to a 5-digit number. Can we find other contexts around us that contain numbers in this range? Let us consider the situation below.

A book has around 200 pages, and each page has about 50 words. The book therefore has about 10,000 words in all.

Find something in the textbook whose count is a 4-digit number.

Now, let us try this with our school.

(a) Our school has _____ classrooms.
(b) There are _____ students in my class.
(c) Our classroom has _____ books in total.

Usually, we measure distances in sea and air using nautical miles. For now, we will use 1 km = 1,000 m. By now, you know different units of measuring length. We will study the units for measuring length, kilometre, in detail in a later chapter.

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Find something in the classroom whose count is a—
(i) 4-digit number. (ii) 5-digit number.

List some quantities whose count is a 4-digit or a 5-digit number in the context of—

(i) A tree.

(ii) Your village/town/city, or any other place of your choice.

Pastime Mathematics

Sanju and Mira are traveling on a train. To pass time, they challenge each other with games and puzzles.

1. Mira poses the **river crossing puzzle** to Sanju.

A boatman wants to cross a river in a boat. He has to take a lion, a sheep, and a bundle of grass with him. He can take one of them at a time. If the sheep and grass are left on the shore, the sheep will eat the grass. And, if the sheep and lion are left on the shore, the lion will eat the sheep.

How can the boatman take the lion, sheep, and grass across the river?

Help him so that he can ferry the lion, sheep, and grass across the river safely, and in the minimum number of trips.

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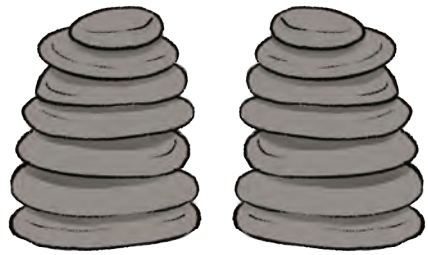
2. Sanju introduces a game called **pile of pebbles** to Mira.



There are two piles of pebbles. Each pile contains 7 pebbles. Each player can pick as many pebbles they want from either of the piles. The player who picks the last pebble wins.

Try this game with your friends. Now, how do you play so that you win?

To find a winning strategy, try playing with 1 pebble in each pile, two in each, three in each, and so on.

3. Now, it's Mira's turn. She gives a fun puzzle to Sanju with the following steps—

		For example
(a)	Take any two different digits.	→ 3 and 7
(b)	Make two 2-digit numbers using them.	→ 37 and 73
(c)	Subtract the smaller number from the bigger number.	→ 73 – 37 = 36

Now, use the two digits in the difference and repeat steps (b) and (c).

Continue this process until you get a 1-digit number. Even before everyone could finish, Mira exclaimed, "Mind you! No matter which two numbers you choose, you will get 9 in the end."

The whole process will look as shown below.

$$\begin{array}{r} 73 \\ -\,37 \\ \hline 36 \end{array} \longrightarrow \begin{array}{r} 63 \\ -\,36 \\ \hline 27 \end{array} \longrightarrow \begin{array}{r} 72 \\ -\,27 \\ \hline 45 \end{array} \longrightarrow \begin{array}{r} 54 \\ -\,45 \\ \hline 9 \end{array}$$

How did Mira know what the 1-digit number in the end would be?

Let us explore.

(1) Observe the differences you get in each step above. Do you notice anything in common?

(2) Try the puzzle using any other pair of digits. What is common to these differences? What do you get in the end?

(3) What digits can you choose so that you get a 1-digit number in the first step itself? Give some examples. Describe the pattern in the digits.

Note for Teachers: Encourage the students to think logically and strategically while solving these puzzles. Such thinking underlies all of mathematics.

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(4) Now, find different digits such that the difference between the numbers is 27.

(5) Mira found an interesting relationship between the two digits and the difference obtained. Can you see it in the table that Mira made?

Digits	Differences in digits	Difference in numbers formed by the digits
3, 7	7 – 3 = 4	73 – 37 = 36
1, 9	9 – 1 = 8	91 – 19 = 72
2, 8	8 – 2 = 6	82 – 28 = 54
4, 5	5 – 4 = 1	54 – 45 = 9

Extend this table by choosing appropriate digits so that the resulting differences are 2, 3, 5, and 7 respectively.

What do the differences between the digits indicate?

List the numbers that give a 1-digit number in the third subtraction.

Identify pairs of digits that lead to the 1-digit number after the maximum possible number of subtractions. Compare your answers with your friends.

Let Us Do

1. Write 5 numbers between the numbers 23,568 and 24,234.

   _____, _____, _____, _____, and _____

2. Write 5 numbers that are more than 38,125 but less than 38,600.

   _____, _____, _____, _____, and _____

3. Ravi's car has been driven for 56,987 km till now. Sheetal's car has been driven 67,543 km. Whose car has been driven more? _____.

4. The following are the prices of different electric bikes. Arrange the prices in ascending (increasing) order.

   ₹90,000 ₹89,999 ₹94,983 ₹49,900 ₹93,743 ₹39,999

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5. The following table shows the population of some towns. Arrange them in a descending (decreasing) order.

Town	Population
Town 1	65,232
Town 2	53,231
Town 3	56,380
Town 4	51,336
Town 5	45,858
Town 6	66,540

_____, _____, _____, _____, _____, _____,

6. Find numbers between 42,750 and 53,500 such that the ones, tens, and hundreds digits are all 0? _____.

7. Write the following numbers in the expanded form. One has been done for you.

(a) 783 = 700 + 80 + 3

(b) 8,062 = _____.

(c) 9,980 = _____.

(d) 10,304 = _____.

(e) 23,004 = _____.

(f) 70,405 = _____.

8. Fill in the blanks with the correct answer. Share your thoughts in class.

90 Tens is 900, so remaining 83 will be Ones

(a) 983 = 90 Tens + 83 Ones

(b) 68 = ___Tens + 18 Ones

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(c) 607 = 4 Hundreds + ___Ones

(d) 5,621 = 4 Thousand + ___Hundreds + 2 Tens + ___Ones

(e) 7,069 = ___ Thousand + 20 Hundreds + ___Ones

(f) 37,608 = ___Ten Thousand + 17 Thousand + ___Hundreds + 8 Ones

(g) 43,001 = 3 Ten Thousand + ____ Thousand + ____ Hundreds + 1 Ones

9. Fill in the blanks with the correct answers.

3 Tens is 30, 90 Tens in 900, and 700 Tens in 7000

(a) How many notes of ₹10 are there in ₹7,934? **793**

(b) How many notes of ₹100 are there in ₹7,934? _____

(c) How many thousands are there in 7,934? _____

(d) How many ₹500 notes are there in ₹7,934? _____

(Hint: Observe the answer of (iii))

(e) How many notes of ₹10 are there in ₹65,342? _____

(f) How many notes of ₹100 are there in ₹65,342? _____

(g) How many thousands are there in 65,342? _____

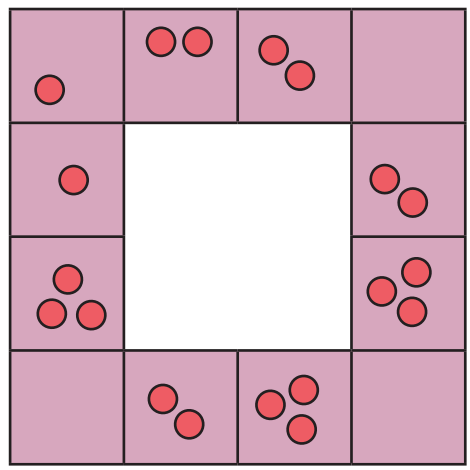
(h) How many ₹500 notes are there in ₹65,342? _____

King's Horses

Once upon a time, there was a king who was very fond of horses. He had 20 horses of the best breed. The horses were kept in the royal stable, and cared for by a caretaker.

One night, a thief stole one of the horses. Fearing punishment, the caretaker arranged the horses in the stable as shown in the picture here.

The next day, when the king came to check on the horses, the caretaker led him around the square stable. "Please count the number of horses along each side, your majesty," he said.



The dots above show how the horses were arranged in the stable.

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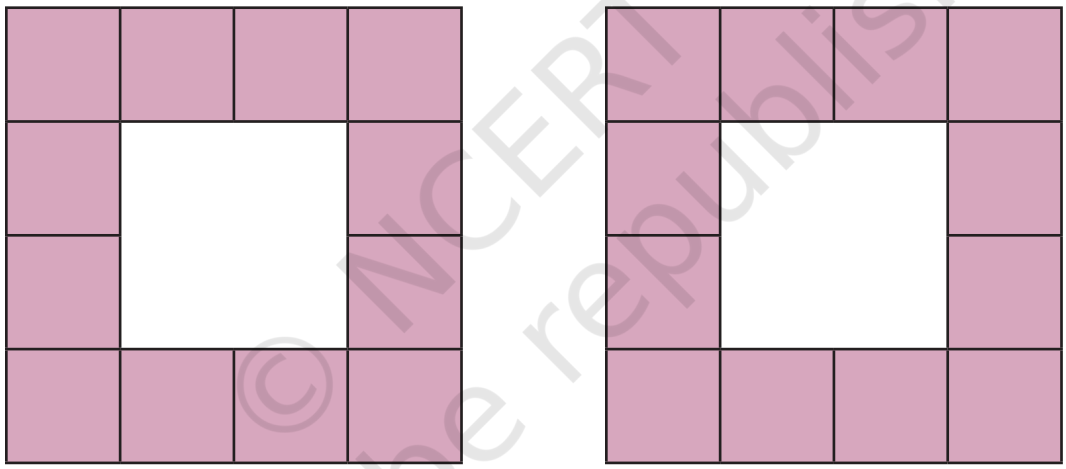
The king counted 5 horses along each side. “We have 5 horses along each side and there are 4 sides. So there are a total of 20 horses, your majesty,” the caretaker explained.

Satisfied with the explanation, the king returned to his palace.

But wait, were there really 20 horses in the stable? Count the horses one by one and check! What was the mistake in the caretaker’s explanation?

The following night, the thief stole another horse from the stable. Now, only 18 horses remained. The caretaker once again cleverly arranged the 18 horses, so that there were 5 horses on each side of the square stable. How do you think he was able to do it? Arrange the 18 horses in the stable with 5 on each side.

How many more horses can the thief steal before the king notices something is wrong? Try making the arrangements yourself.



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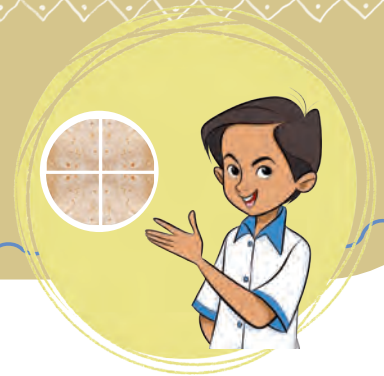
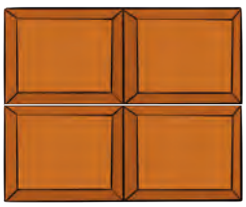
Chapter

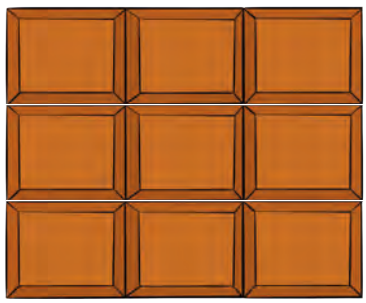
2 Fractions



Tamanna is a student of Grade 5. She has two chocolates of different sizes. She says that $\frac{1}{3}$ of one of her chocolates is bigger than $\frac{1}{2}$ of the other chocolate. Is that correct? Explain why this is so.



Identify $\frac{1}{2}$ of the chocolate



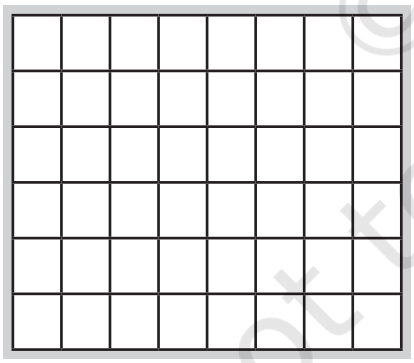
Identify $\frac{1}{3}$ of the chocolate

When can we say that $\frac{1}{2}$ of something is greater than $\frac{1}{3}$ of something?

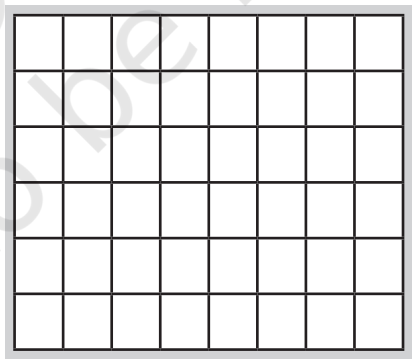
To compare two fractions of two wholes, the wholes from which the fractions are derived must be the same.

Playing with a Grid

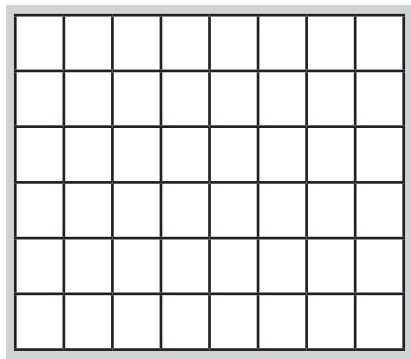
A



B



C



- Shade $\frac{1}{8}$ of Grid A in **red**.
- Shade $\frac{1}{6}$ of Grid B in **blue**.
- Shade $\frac{1}{12}$ of Grid C in **yellow**.
- Do you see $\frac{1}{3}$ in any of the grids? Mark it.

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Is $\frac{1}{3}$ equal to $\frac{2}{6}$? Let us find out.

Look at the picture and identify the fractions.

Are there two different ways to write the fraction represented by the shaded part? _____

Do you see that $\frac{1}{3} = \frac{2}{6}$? Yes. These are called '**equivalent fractions**'.

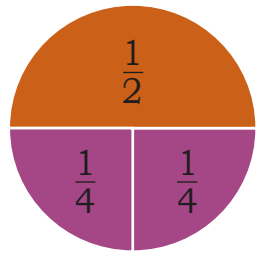
Let us see how equivalent fractions can be generated.

Fun with Fraction Kit

Gurpreet is playing with his fraction kit (a kit is given at the end of the textbook). Do you remember how to make a whole with pieces of the same size? How many $\frac{1}{5}$ pieces will you need to make a whole?

He makes a whole using two different fraction pieces. The whole looks like the following.

One piece of $\frac{1}{2}$ and two pieces of $\frac{1}{4}$ make a whole. What is the relation between $\frac{1}{2}$ and $\frac{1}{4}$? Discuss in class.



$\frac{1}{2} = \frac{2}{4}$ ($\frac{1}{2}$ is equivalent to $\frac{2}{4}$).

When a $\frac{1}{2}$ piece is broken into 2 equal parts, each part is a $\frac{1}{4}$ piece.

2 pieces of $\frac{1}{4}$ are equal to $\frac{1}{2}$.

What else is equivalent to $\frac{1}{2}$?

$\frac{1}{2} = \frac{2}{4} =$ ____ $=$ ____ $=$ ____

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Let Us Do

1. In groups of 3 or 4, find different ways of making a whole with different fraction pieces from your kit. Write the equivalent fractions for the following that you may find in the process.

   (a) $\frac{1}{3}$ = = = (b) $\frac{1}{4}$ = = =

   (c) $\frac{1}{5}$ = = = (d) $\frac{1}{6}$ = = =

Do you see how to generate equivalent fractions for any given fraction? Discuss in class.

2. Find the following using your kit. You can also shade and check by shading the following. The first one is partially done for you.

   A. How many $\frac{1}{6}$s make $\frac{1}{3}$?

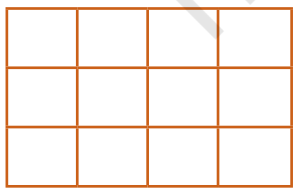
The shaded part is $\frac{1}{3}$. Identify $\frac{1}{6}$ in the same whole and find how many $\frac{1}{6}$s fit into $\frac{1}{3}$?

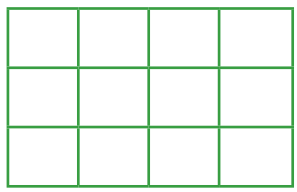
   B. How many $\frac{1}{8}$s make

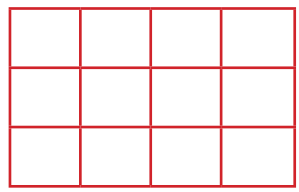
   (a) $\frac{1}{4}$? (b) $\frac{1}{2}$?

   C. How many $\frac{1}{12}$s make

   (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{6}$?







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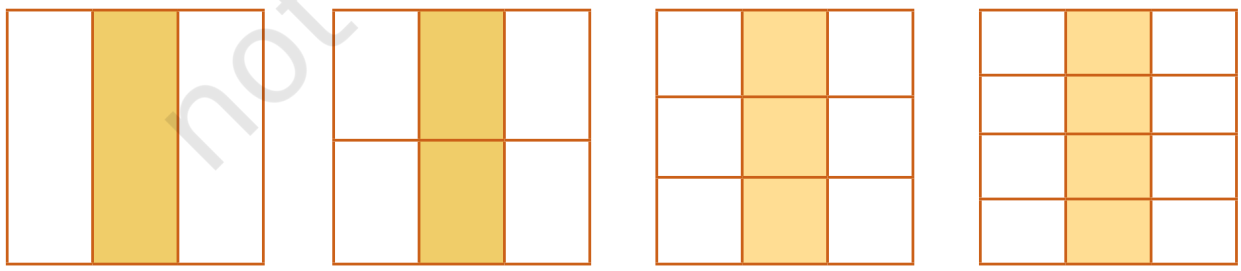
3. Do as instructed using your fraction kit.

- Make a whole using only $\frac{1}{6}$ and $\frac{1}{12}$ pieces.
- Make a whole using $\frac{1}{12}$, $\frac{1}{4}$, and $\frac{1}{2}$ pieces.
- Make a whole using any five pieces of the same size.
- Make a whole using any seven pieces.

Play in a group with this kit and find other interesting combinations to make a whole. Write or draw your findings.

Making Equivalent Fractions

Sameer has shaded one-third of the following figures. He draws horizontal lines to divide the shapes into more equal parts.



$\frac{1}{3}$ $\frac{2}{6}$ $\frac{3}{9}$ $\frac{4}{12}$

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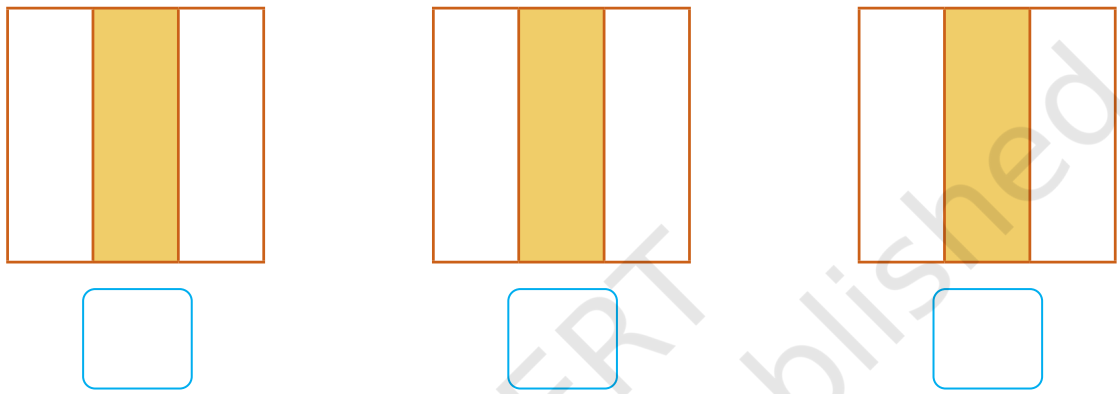
He observes an interesting pattern and says that $\frac{1}{3}$, $\frac{2}{6}$, $\frac{3}{9}$, and $\frac{4}{12}$ show the same shaded region.

$\frac{2}{6}$, $\frac{3}{9}$, and $\frac{4}{12}$ are all equivalent to $\frac{1}{3}$. We use the word '**equivalent**' to indicate the same part of a whole, with different names.

Divide the wholes given below into more equal parts and find fractions equivalent to $\frac{1}{3}$. Write them in the boxes below the images.

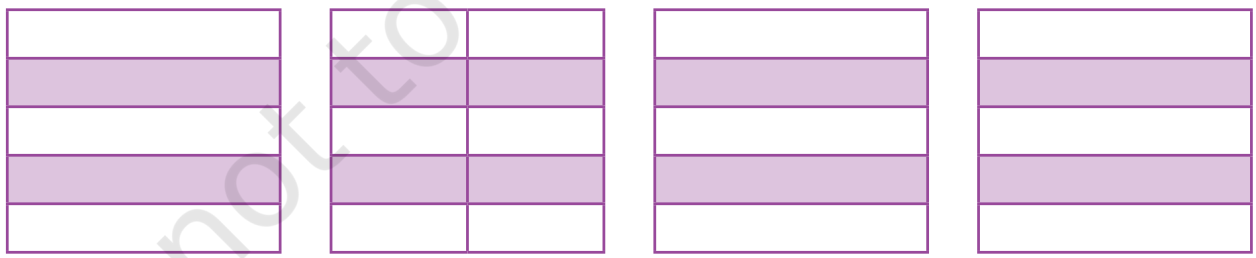


Do you see any pattern in all the equivalent fractions that you found?

$\frac{1}{3} = \frac{2}{6} = \frac{3}{9} = \frac{4}{12} = \_\_\_\_ = \_\_\_\_ = \_\_\_\_ = \frac{\square}{24} = \frac{\square}{36}$

How do you know when a fraction is equivalent to another? Discuss in class.

The below pictures show $\frac{2}{5}$ of a whole. Find the different fractions that are equivalent to $\frac{2}{5}$ and write your fractions below each image.



$\frac{2}{5}$ $\quad$ $\frac{4}{10}$ $\quad$ $\frac{\square}{\square}$ $\quad$ $\frac{\square}{\square}$

$\frac{2}{5} = \frac{4}{10} = \_\_\_\_ = \_\_\_\_ = \frac{\square}{50} = \frac{\square}{100}$

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Let Us Do

1. Fill in the blanks with equivalent fractions. There may be more than one answer.

   (a) $\frac{1}{7}$ = _____ (b) $\frac{2}{3}$ = _____

   (c) $\frac{3}{4}$ = _____ (d) $\frac{3}{5}$ = _____

2. Put a tick (✓) against the fractions that are equivalent.

   (a) $\frac{2}{3}$ and $\frac{3}{4}$ (b) $\frac{3}{5}$ and $\frac{6}{10}$

   (c) $\frac{4}{12}$ and $\frac{2}{6}$ (d) $\frac{6}{9}$ and $\frac{1}{3}$

3. Fill in the boxes such that the fractions become equivalent.

   (a) $\frac{2}{5} = \frac{\square}{10}$ (b) $\frac{3}{4} = \frac{\square}{16}$

   (c) $\frac{4}{7} = \frac{8}{\square}$ (d) $\frac{5}{9} = \frac{25}{\square}$

Comparing Fractions—Same Denominator

Sevi and Shami divided a piece of *chikki* between themselves. Sevi ate $\frac{1}{3}$ and Shami ate the rest, that is, $\frac{2}{3}$. Who ate more?

2 pieces of $\frac{1}{3}$ are more than 1 piece of $\frac{1}{3}$. So, Shami ate more.

$\frac{2}{3} > \frac{1}{3}$

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Let Us Do

1. Compare the fractions given below using < and > signs.

(a) $\frac{1}{4}$ ____ $\frac{3}{4}$

(b) $\frac{3}{5}$ ____ $\frac{4}{5}$

(c) $\frac{5}{7}$ ____ $\frac{2}{7}$

(d) $\frac{7}{8}$ ____ $\frac{3}{8}$

(e) $\frac{5}{10}$ ____ $\frac{6}{10}$

(f) $\frac{2}{6}$ ____ $\frac{1}{6}$

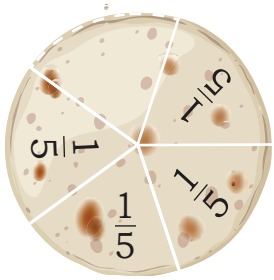
Comparing Fractions—Same Numerator

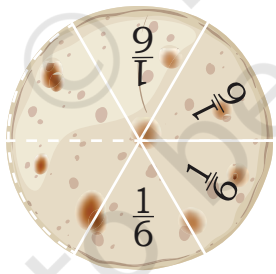
I ate $\frac{4}{6}$ paratha yesterday evening.

I ate $\frac{4}{5}$ paratha yesterday evening.

Between Sevi and Shami, can you tell who ate more? Use your fraction kit to find the answer.

Do the following pictures help you reason? Share your thoughts in the class.





$\frac{1}{6}$ piece is smaller than $\frac{1}{5}$ piece. Therefore, $\frac{4}{6} < \frac{4}{5}$.

Let Us Do

1. Compare the following fractions using < and > signs.

(a) $\frac{3}{8}$ ____ $\frac{3}{7}$

(b) $\frac{4}{9}$ ____ $\frac{4}{10}$

(c) $\frac{2}{7}$ ____ $\frac{2}{5}$

(d) $\frac{5}{7}$ ____ $\frac{5}{6}$

(e) $\frac{6}{9}$ ____ $\frac{6}{10}$

(f) $\frac{7}{9}$ ____ $\frac{7}{11}$

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Fractions Greater Than 1

Raman's father makes nice soft parathas. He cuts the parathas either into halves (2 equal parts) or fourths (4 equal parts) before serving them. He asks his children (Raman and Radhika) each day to find out the number of parathas he made.

Maa took 5 pieces of $\frac{1}{2}$ paratha. How many parathas did she eat?

1 paratha

1 paratha

$\frac{1}{2}$ paratha

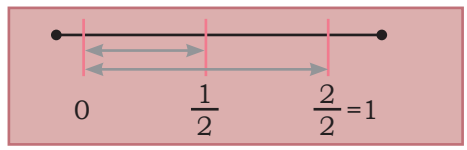
$\underbrace{\frac{1}{2}+\frac{1}{2}}_{1}+\underbrace{\frac{1}{2}+\frac{1}{2}}_{1}+\frac{1}{2}$

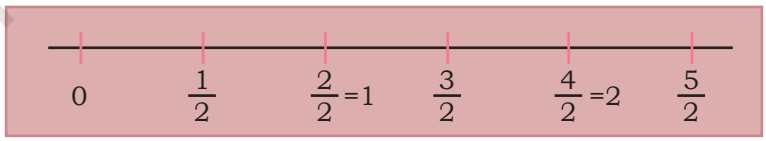
5 pieces of $\frac{1}{2}$ paratha = $\frac{5}{2}$ parathas

$= 2 + \frac{1}{2}$ parathas

$= 2\frac{1}{2}$ parathas

We can also show the same on a number line. Divide the distance between 0 and 1 in two equal parts. Each part is $\frac{1}{2}$. 2 halves make 1. Placing 5 halves next to each other takes us to $\frac{5}{2}$ or $2\frac{1}{2}$.





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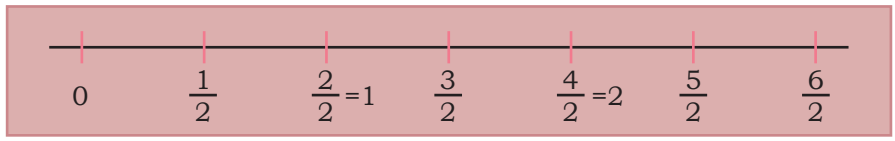
Raman's sister Radhika took 6 pieces of $\frac{1}{2}$ paratha. How many parathas did she eat?



$\underbrace{\frac{1}{2}+\frac{1}{2}}_{1} + \underbrace{\frac{1}{2}+\frac{1}{2}}_{1} + \underbrace{\frac{1}{2}+\frac{1}{2}}_{1} = \frac{6}{2}$ parathas = 3 parathas.

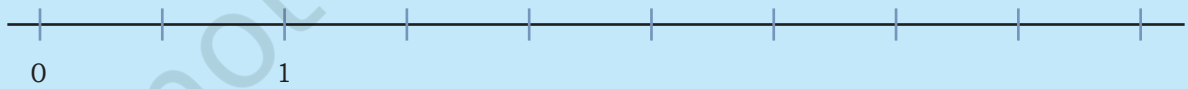
Dadiji had 7 pieces of $\frac{1}{2}$ paratha. How many parathas did she eat? Find out.

Raman ate 6 pieces of $\frac{1}{2}$ paratha, *Dadaji* ate 7 pieces of $\frac{1}{2}$ paratha and *Baba* ate 5 pieces of $\frac{1}{2}$ paratha. How many parathas did each of them eat?

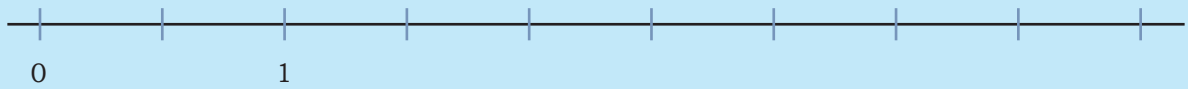
Use the number line to find the answer.

Quantity of Raman's paratha

Quantity of *Dadaji*'s paratha



Quantity of Baba's paratha



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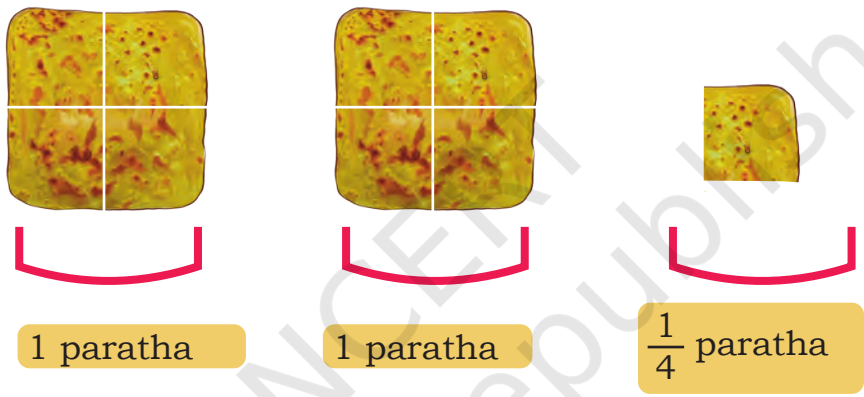
How many parathas were made on this day? Find out.

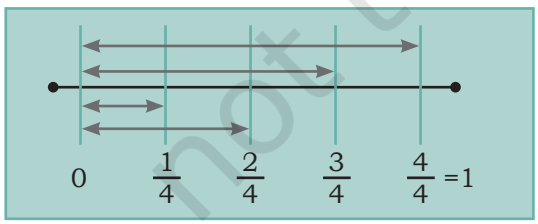
Another day, Raman's father cut all the parathas in $\frac{1}{4}$. *Dadaji* took 9 pieces of $\frac{1}{4}$ paratha. How many parathas did he eat?



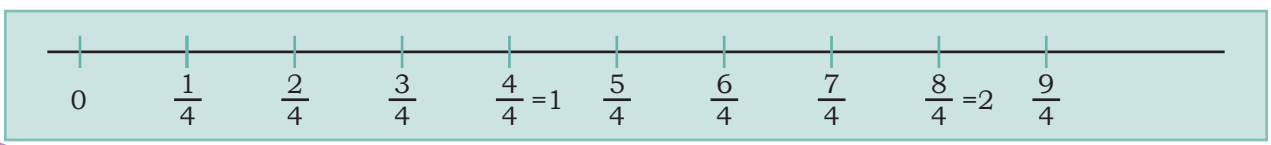
$\underbrace{\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}}_{1} + \underbrace{\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}}_{1} + \frac{1}{4} = \frac{9}{4}$ parathas

$= 2 + \frac{1}{4}$ parathas

$= 2\frac{1}{4}$ parathas



We can also show the same on a number line. Divide the distance between 0 and 1 into four equal parts. Each part is $\frac{1}{4}$. 4 one-fourths make 1. Placing 9 one-fourths next to each other takes us to $\frac{9}{4}$ or $2\frac{1}{4}$.



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Raman ate 7 pieces of $\frac{1}{4}$, Radhika ate 6 pieces of $\frac{1}{4}$, *Maa* ate 8 pieces of $\frac{1}{4}$, *Dadiji* ate 10 pieces of $\frac{1}{4}$, and *Baba* ate 12 pieces of $\frac{1}{4}$ paratha. Use a number line to find out how many parathas were eaten by each of them.

Quantity of Raman's paratha

0 1

Quantity of Radhika's paratha

0 1

Quantity of *Maa*'s paratha

0 1

Quantity of *Dadiji*'s paratha

0 1

Quantity of *Baba*'s paratha

0 1

How many parathas were made on this day? Find out.

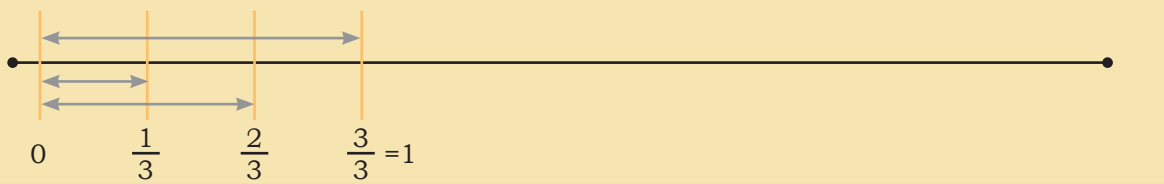
Raman's family of 6 members ordered 2 pizzas and cut each pizza into 3 equal slices so that each family member had one slice. *Dadiji* and *Dadaji* gave their slices to Raman, *Maa,* and *Baba* gave theirs to Radhika. How much pizza do each of them have after this?

Raman's slice

Raman's total share

$$\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{3}{3} = 1$$

Raman's total share—whole pizza



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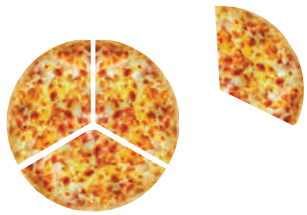
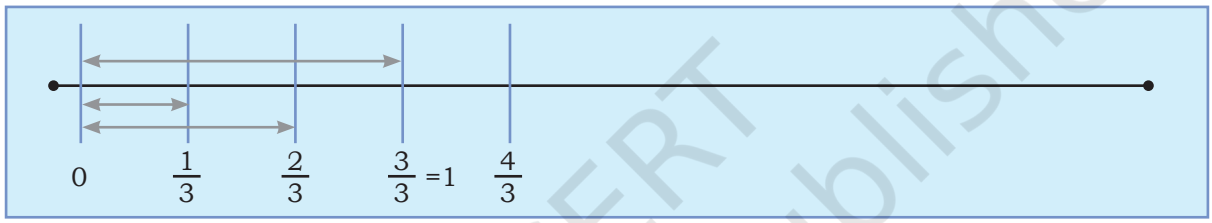
Raman could eat only 2 slices of pizza. So, he gave 1 to Radhika. How much pizza does Radhika have now?

Radhika's slice



Radhika's total share

$$\underbrace{\frac{1}{3}+\frac{1}{3}+\frac{1}{3}}_{1}+\frac{1}{3} = \frac{4}{3} = 1+\frac{1}{3} = 1\frac{1}{3}$$



Let Us Do

1. Use parathas and number lines to show the following fractions in your notebook.

   (a) $\frac{2}{3}$ and $\frac{5}{3}$ (b) $\frac{3}{4}$ and $\frac{5}{4}$ (c) $\frac{4}{8}$ and $\frac{9}{8}$

2. Circle the fractions that are greater than one (whole). How do you know? Discuss your reasoning in the class.

$\frac{7}{9}$ $\frac{3}{9}$ $\frac{7}{11}$ $\frac{9}{4}$ $\frac{9}{4}$ $\frac{4}{9}$ $\frac{2}{5}$ $\frac{5}{7}$ $\frac{5}{4}$ $\frac{7}{3}$ $\frac{2}{3}$ $\frac{13}{11}$ $\frac{12}{5}$ $\frac{12}{8}$

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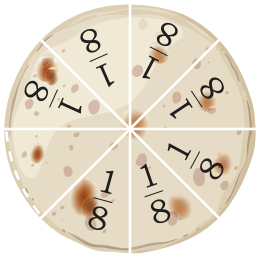
Comparing Fractions With Reference to 1 (a whole)

Let us compare some more fractions. Between Sevi and Shami can you tell who ate less?

I ate $\frac{7}{8}$ paratha yesterday evening.

I ate $\frac{8}{6}$ paratha yesterday evening.



$\frac{7}{8}$ is less than 1 and $\frac{8}{6}$ is more than 1. So, $\frac{7}{8} < \frac{8}{6}$.

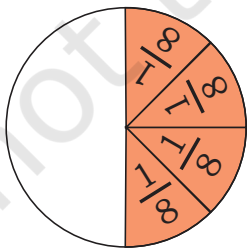
Let Us Do

1. Compare the following fractions using 1 as a reference. Share your reasoning in the class.

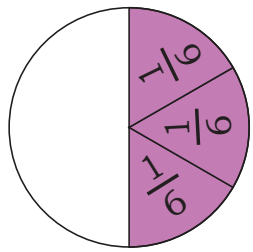
(a) $\frac{8}{7}$ _____ $\frac{9}{15}$ (b) $\frac{13}{20}$ _____ $\frac{17}{15}$ (c) $\frac{7}{6}$ _____ $\frac{8}{8}$

(d) $\frac{6}{6}$ _____ $\frac{19}{12}$ (e) $\frac{12}{9}$ _____ $\frac{4}{5}$ (f) $\frac{15}{5}$ _____ $\frac{16}{4}$

Comparing Fractions with Reference to $\frac{1}{2}$



$\frac{4}{8} = \frac{1}{2}$



$\frac{3}{6} = \frac{1}{2}$

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Let Us Do

1. Circle the fractions below that are equal to $\frac{1}{2}$.

$\frac{2}{4}$ $\frac{3}{5}$ $\frac{5}{7}$ $\frac{7}{14}$ $\frac{5}{10}$ $\frac{8}{16}$

$\frac{5}{9}$ $\frac{6}{12}$ $\frac{10}{20}$ $\frac{6}{8}$

2. Some fractions are written in the box below. Circle the fractions that are less than half. How do you know? Discuss your reasoning in the class.

$\frac{3}{9}$ $\frac{2}{4}$ $\frac{12}{15}$ $\frac{8}{15}$ $\frac{11}{12}$ $\frac{3}{15}$

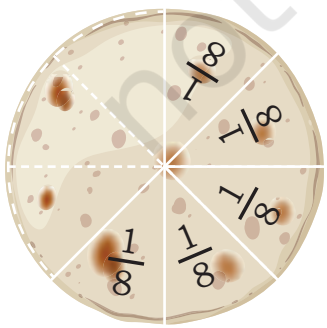
$\frac{4}{8}$ $\frac{1}{3}$ $\frac{7}{11}$ $\frac{11}{16}$ $\frac{15}{31}$ $\frac{6}{18}$

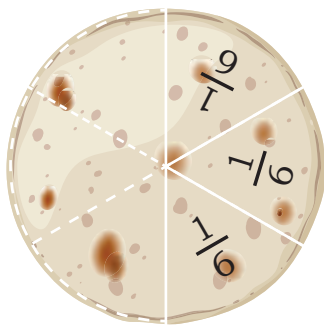
Now let us compare fractions using $\frac{1}{2}$.

I ate $\frac{5}{8}$ paratha yesterday evening

I ate $\frac{3}{6}$ paratha yesterday evening

Who do you think ate more paratha?





$\frac{3}{6}$ is half. But $\frac{5}{8}$ is more than $\frac{1}{2}$.

So, $\frac{5}{8} > \frac{3}{6}$.

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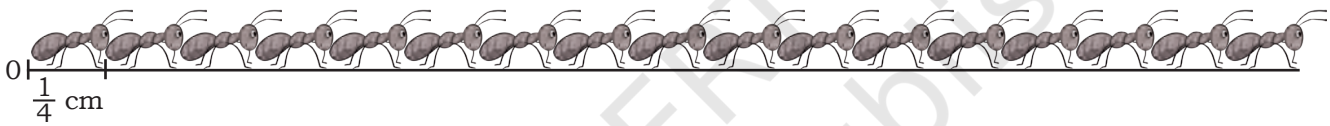
3. Compare the following fractions. Where possible, compare the fractions with $\frac{1}{2}$.

$\frac{2}{9}$ and $\frac{4}{7}$	$\frac{11}{14}$ and $\frac{7}{20}$	$\frac{5}{7}$ and $\frac{3}{9}$	$\frac{6}{7}$ and $\frac{4}{10}$
$\frac{9}{17}$ and $\frac{3}{15}$	$\frac{7}{12}$ and $\frac{3}{11}$	$\frac{1}{3}$ and $\frac{5}{9}$	$\frac{3}{9}$ and $\frac{4}{7}$

Try This

If the length of an ant is $\frac{1}{4}$ cm—then what is the total length of 16 such ants walking in a line? Use the number line given below.



Fun with Relations

If the only brother of your father's sister had a child, what would be the child's relationship with you?

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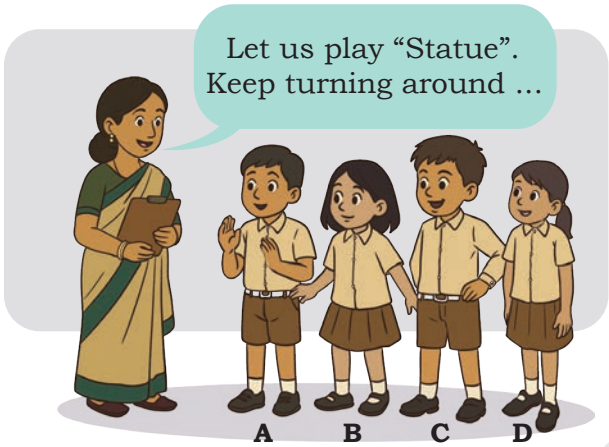
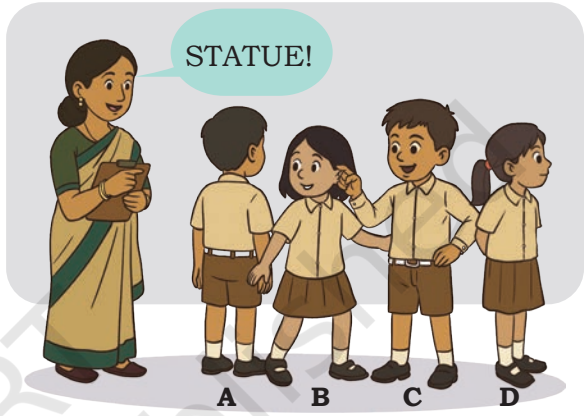
Chapter

3 Angles as Turns

Can you recognise the child in the picture who has made a full turn? Who has made a half turn? How do you know? Discuss in class.



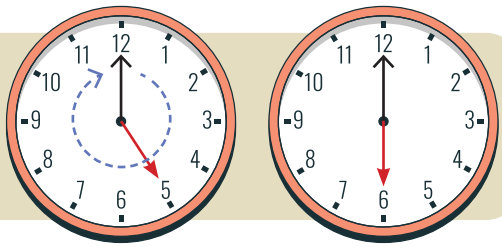


Give examples of real-life situations where you observe turns.

Ashutosh and Sahana are making circles, each having one foot fixed and rotating at one spot on the ground.

Ashutosh made a complete circle by making a full turn. Sahana is making a half-moon shape with a half turn.

The minute hand makes a full turn when it comes back to the initial position.



Note for Teachers: Encourage the learners to play the "statue" game. Learners can be asked to rotate themselves around and stop as the teacher announces "statue". The learners can notice how much they have turned with respect to their original position.

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A giant wheel makes a full turn when it comes back to the starting position E.

Reema takes two half turns in the same direction.

It is like a _____turn.

What happens if she takes 2 quarter turns in the same direction?

It is like a _____turn.

What happens if she takes 4 quarter turns in the same direction?

It is like a ____ turn.

Write some of the everyday objects that involve turns. For example, taps, _____, _____, _____, _____, and _____.

What is the maximum possible turn in each of these cases? Check and tick.

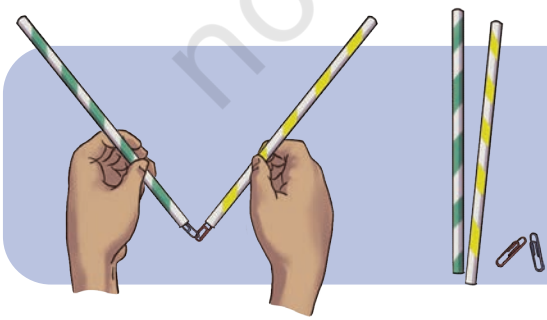
Object	Less than a $\frac{1}{4}$ turn	$\frac{1}{4}$ turn	More than a $\frac{1}{4}$ turn
Clothes clip			
Door with hinge			
Tongs			
Scissors			
File cover			

- Do any of the above objects make a half turn? Write their names below—

  .....

- Do any of the above objects make a full turn? Write their names below—

  .....



Pragya joined a green and yellow straw with paper clips. She holds the green straw steady and turns the yellow straw around. Observe different turns of the yellow straw.

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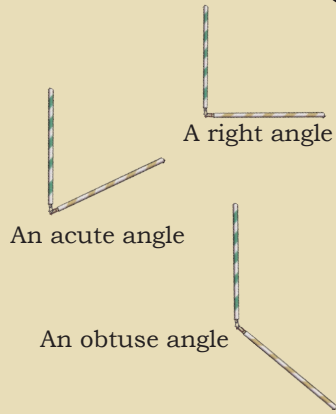
I made a quarter ($\frac{1}{4}$) of a full turn, so it looks like a right angle.

I made less than a quarter turn, so it looks like an acute angle.

Now I made more than a quarter turn, but less than a half turn. That looks like an obtuse angle.

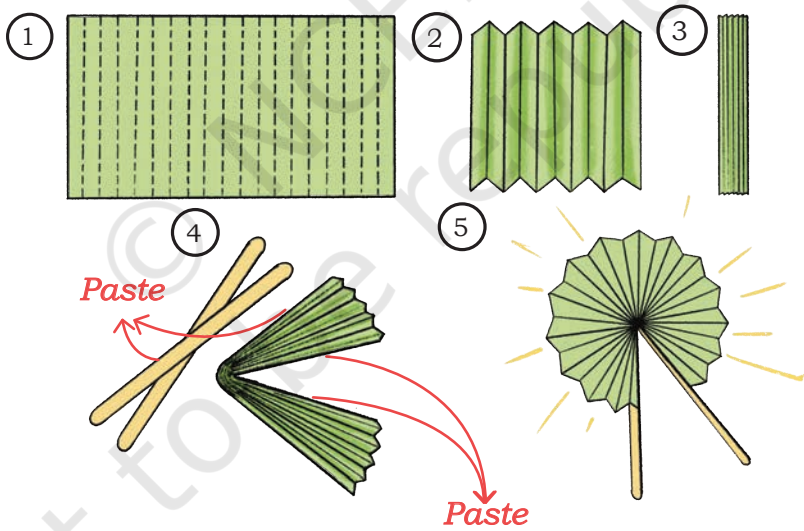
I made two quarter turns. I wonder what it is called?



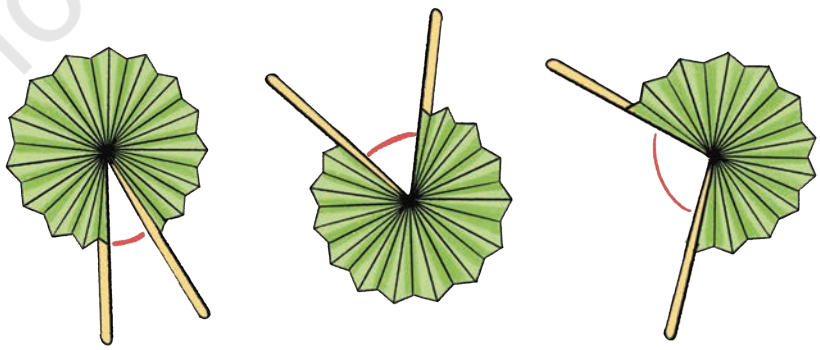
Angles arise in situations that involve a turn.

Let Us Do

(a) Making a paper fan. Take a rectangular paper, fold every 2 cm as shown in the picture. Paste ice cream sticks as shown below to create a paper fan.



Use your paper fan to show different acute angles and obtuse angles.



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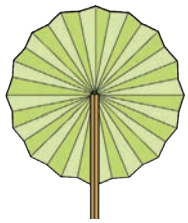
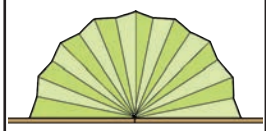
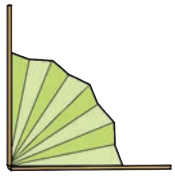
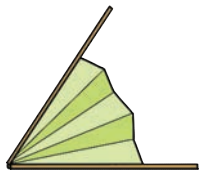
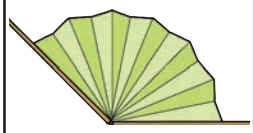
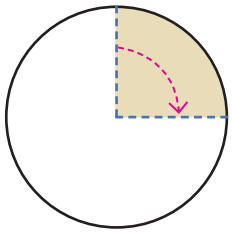
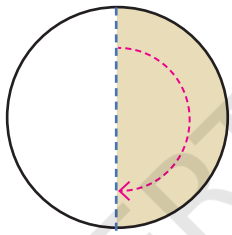
Let us look at the turns made by the paper fan, keeping one side fixed.

Full turn	$\frac{1}{2}$ turn (straight angle)	$\frac{1}{4}$ turn (right angle)	Less than a $\frac{1}{4}$ turn (acute angle)	Between a $\frac{1}{4}$ and $\frac{1}{2}$ turn (obtuse angle)
				

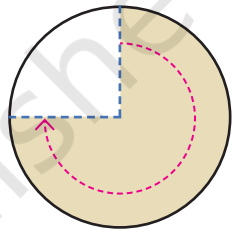
Make an acute turn with the straws or fan. Continue to make another acute turn. Can the two acute turns together make another acute turn?



This shows a $\frac{1}{4}$ turn, or a right angle.



This shows a $\frac{1}{2}$ turn, or a straight angle.



This shows a $\frac{3}{4}$ turn, which is more than a straight angle.

(b) You might have built houses using the hard covers of notebooks or cardboard pieces.

Look at the angles marked in the house. What angles are you able to see in this house?

Write your answers as right, acute or obtuse angle.

A: _____ B: _____

C: _____ D: _____

E: _____ F: _____

G: _____ H: _____

(c) Make a 5-sided shape with 2 right angles, 2 obtuse angles, and 1 acute angle in your notebook.

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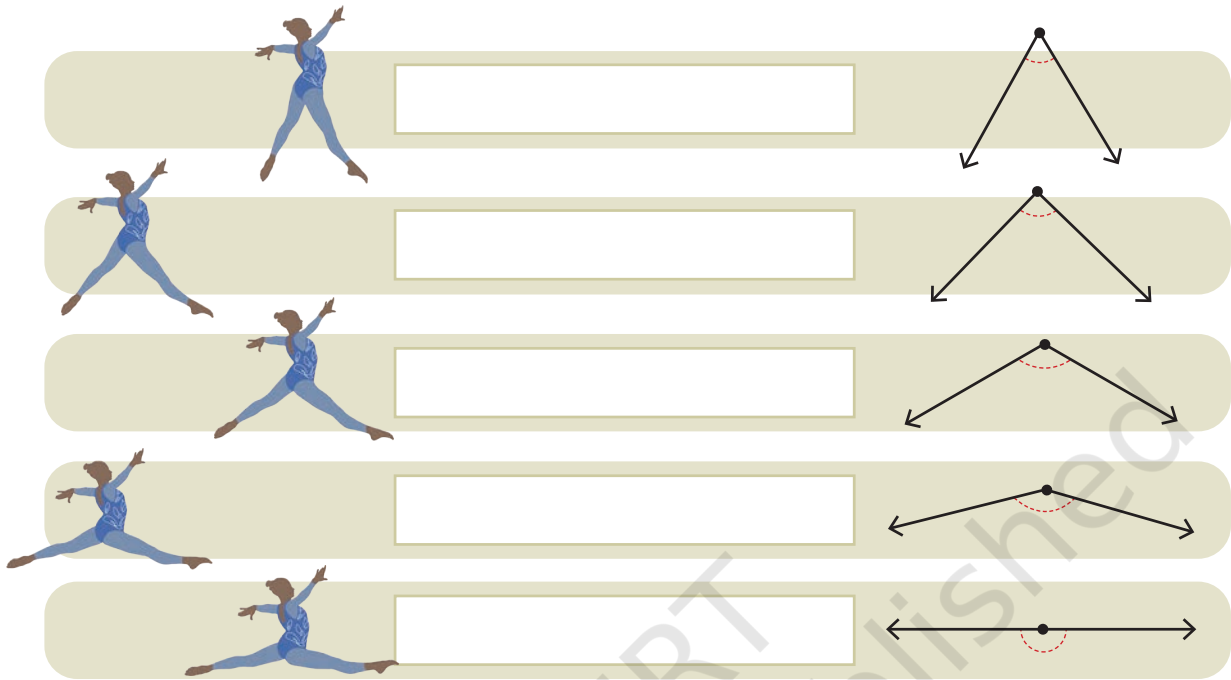
(d) Look at the angle formation between the legs of these gymnasts. Identify whether the angles are acute, obtuse, right or straight.

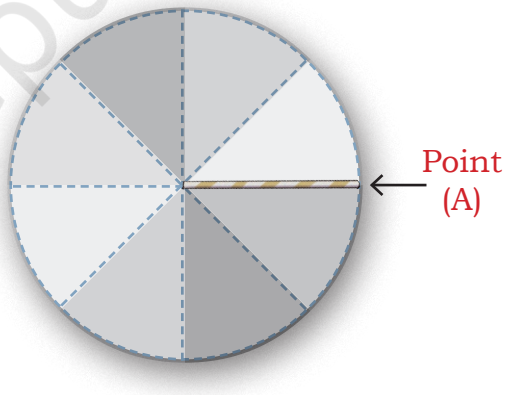


Angle Measuring Tool

Let us make our tool to measure turns.

(a) Cut out a circle from a tracing paper and fold it to make 8 equal parts.

Attach a straw to the centre and mark the starting point as shown.



(b) Now, try this.

- Show a $\frac{1}{8}$ turn of the straw.
- Show a $\frac{2}{8}$ turn. Show a $\frac{1}{4}$ turn. Show a $\frac{3}{8}$ turn.
- What angle have you made with a $\frac{2}{8}$ turn? A $\frac{1}{8}$ turn is half of a quarter turn.
- What angle have you made with a $\frac{4}{8}$ turn?

Continue turning by $\frac{5}{8}$, $\frac{6}{8}$, $\frac{7}{8}$, and $\frac{8}{8}$. Check when you have completed a $\frac{3}{4}$ turn and a full turn.

Now, cut out $\frac{1}{8}$ part and $\frac{2}{8}$ parts of the circle and paste them on a thicker paper or board. Use these as angle measuring tools.

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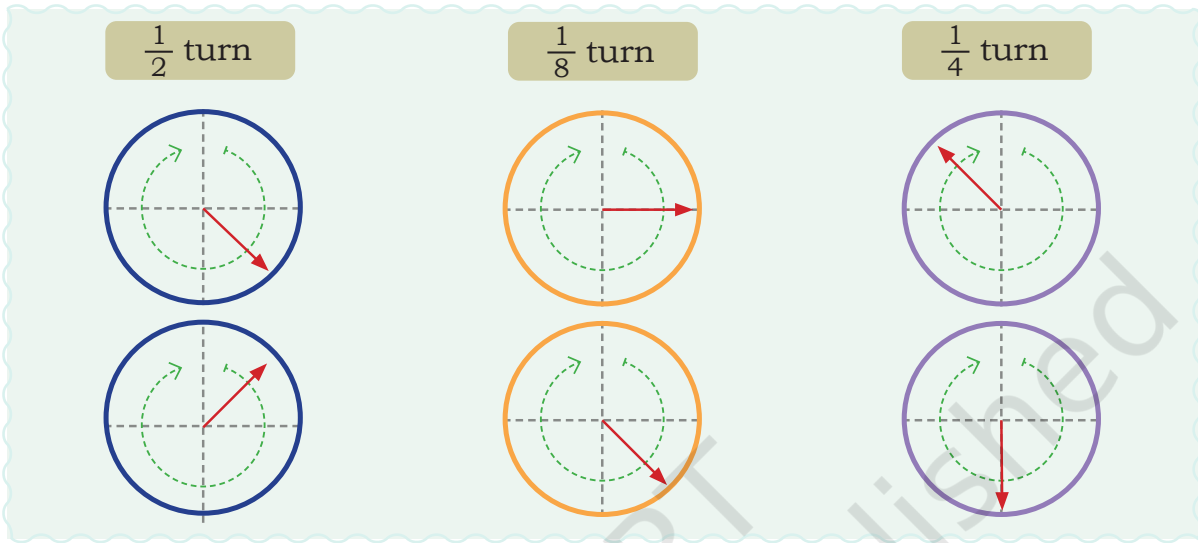
Let Us Think

1. In the following circles, the end points of $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$ turns are shown. Draw arrows to show the starting points.

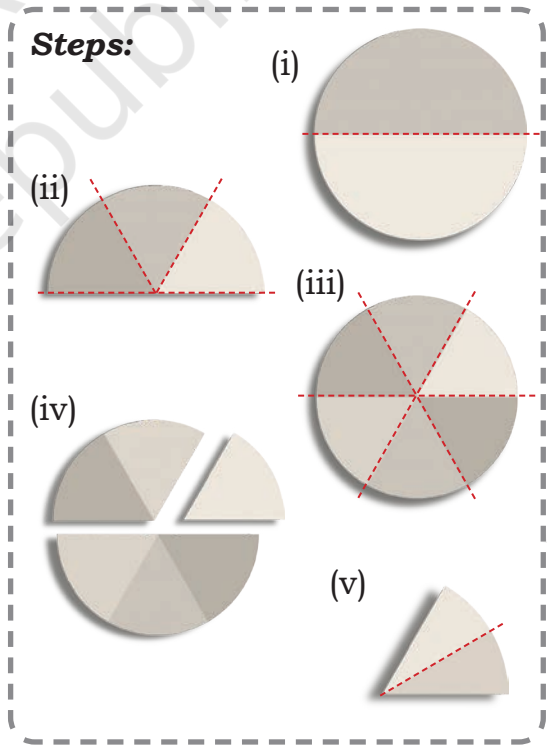


Now, cut out a circle from a tracing paper. First, fold the circle in half, and then fold it again into 3 equal parts. Attach a straw at the centre of the circle. Mark the starting point and show the turns equal to $\frac{1}{6}$, $\frac{2}{6}$, and so on until you complete a full circle.

Cut out $\frac{1}{6}$ part and $\frac{2}{6}$ part of the circle. Fold one of the $\frac{1}{6}$ parts into half.

Can you guess what turn of the straw will be equal to half of a $\frac{1}{6}$ turn? This is the same as a $\frac{1}{12}$ turn.

Paste these parts on a thicker paper or board and you can use them as angle measuring tools.



Note for Teachers: Help the learners to make the angle measuring tools using tracing paper. Use these for measuring various angles. Let them mark the starting point. Also, help them fix a straw at the centre and measure the turns with respect to the starting point.

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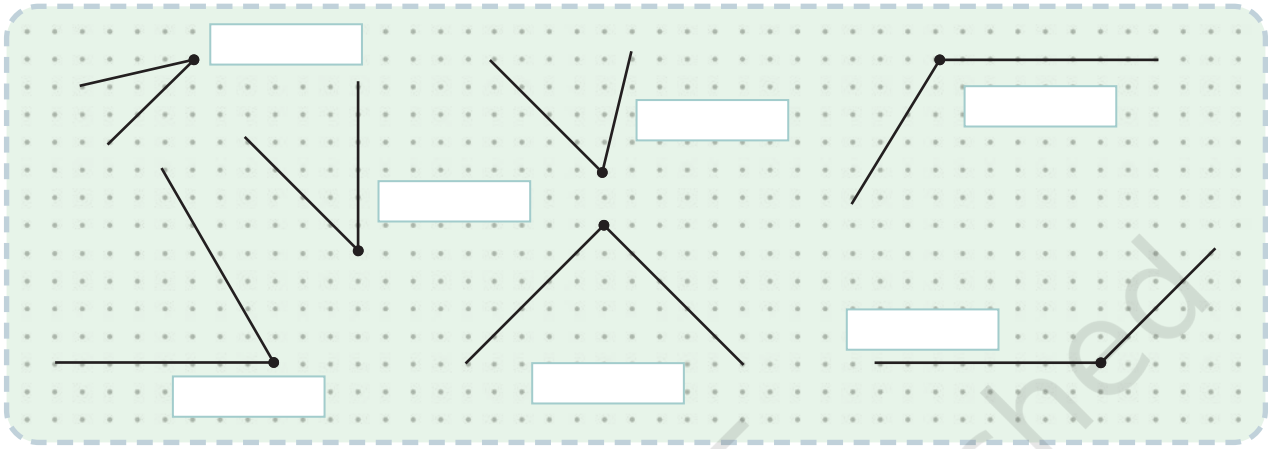
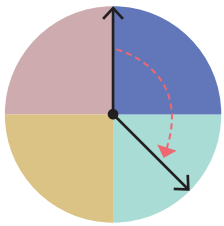
Let Us Do

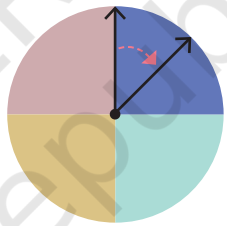
1. Guess the measures of each of the angles shown below. Then, check using your angle measuring tools. You may need to use a combination of measures. Also, state whether each of the angles is acute, right, or obtuse.



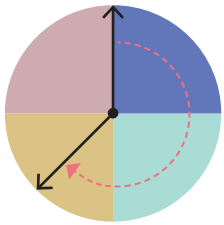
2. Guess the measure of the turns made by the arrow in each of the following cases. Verify with a combination of angle measuring tools.

(a) 

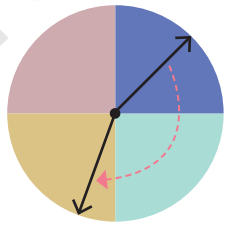
$\frac{1}{4} + \frac{1}{8}$ turn
or $\frac{3}{8}$ turn

(c) 

_____ turn

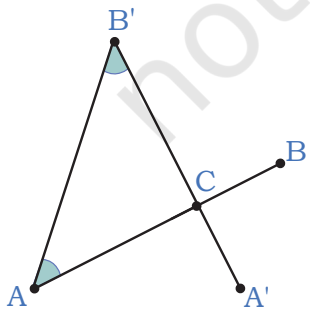
(b) 

_____ turn

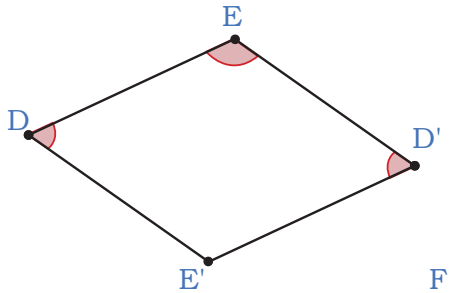
(d) 

_____ turn

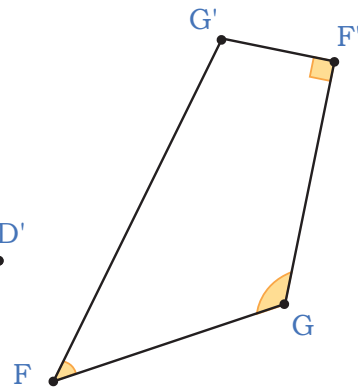
3. Measure each angle in the given shapes. Write the measure of the angles in terms of turns and describe whether they are acute, obtuse or right angles.



(a)



(b)



(c)

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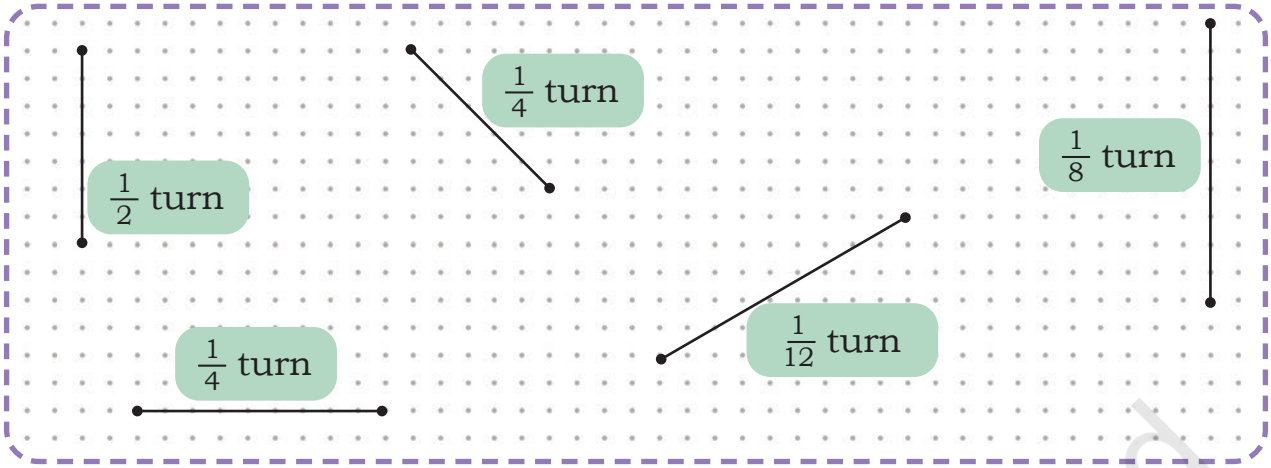
4. Draw angles for the given measures of turns using the given lines.

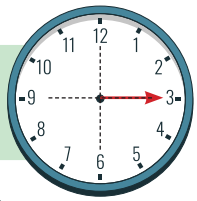


5. Draw the angles formed by the following turns in your notebook.

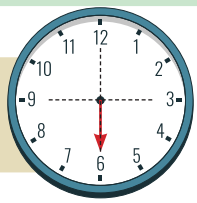
   $\frac{1}{2}$ turn, $\frac{1}{4}$ turn, $\frac{2}{4}$ turn, $\frac{1}{6}$ turn, $\frac{4}{6}$ turn, $\frac{3}{12}$ turn, $\frac{1}{2} + \frac{1}{4}$ turn, and $\frac{1}{8} + \frac{1}{6}$ turn.

6. Guess the measure of turns the minute hand of a clock makes in each of the following cases. The initial position of the minute hand is given. Draw the final position of the minute hand on the clock face. Discuss your reasoning in class.

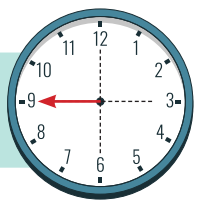
(a) When the minute hand moves by 15 minutes, it has made a _____ turn of the circle.



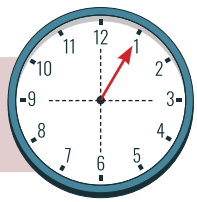
(b) When the minute hand moves by 30 minutes, it has made a _____ turn of the circle.



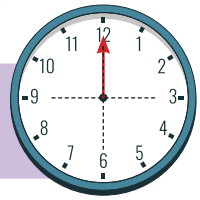
(c) When the minute hand moves by 45 minutes, it has made a _____ turn of the circle.



(d) When the minute hand has turned by $\frac{1}{12}$ of a full turn, it has moved by _____ minutes.



(e) When the minute hand has turned a full-circle, it has moved by _____ minutes.



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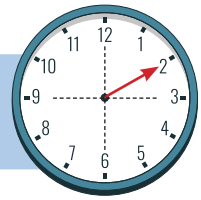
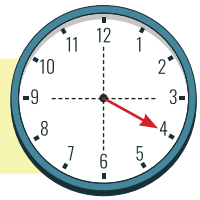
(f) When the minute hand has turned by $\frac{1}{6}$ of a full turn, it has moved by _____ minutes.



(g) When the minute hand has turned by $\frac{4}{12}$ of a full turn, it has moved by _____ minutes.

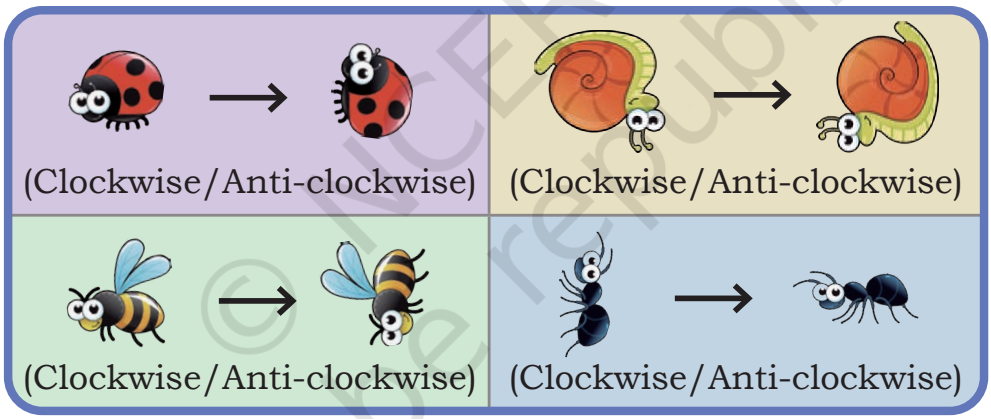


Which direction?

In which direction do the hands of a clock move?

The direction in which the hands of the clock move is called clockwise movement. The opposite movement is called anti-clockwise movement.

The creatures below have made a quarter turn once. Tick the direction in which they have moved.



Try these

Observe the direction of movement while opening a tap, unscrewing a lid or loosening a nut. Do they move clockwise or anti-clockwise?

Fun with Turns

1. The children in a class are playing a game in which the teacher tells them the direction in which they should rotate. Complete the table by filling the direction the children will face on completing the given turns.

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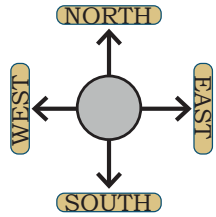
The starting direction is given in the table.



Starting Direction	Turns	Ending Direction
North	Two right angles, clockwise	
South	Two right angles, anti-clockwise	
East	Four right angles, anti-clockwise	
West	Four right angles, clockwise	
North	5 right angles, clockwise	
South	3 right angles clockwise, $\frac{1}{2}$ right angle clockwise, $\frac{1}{2}$ right angle clockwise	
West	right angles clockwise, four $\frac{1}{2}$ right angles anti-clockwise	

2. Padma is facing the toy shop. What place will she face if she takes a half turn clockwise?

What other way can she turn to face the same place?

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Chapter 4

We the Travellers—II

Making Sums Equal

In each of the following, there are two groups of numbers. Look carefully at the numbers in each group and their sums. Interchange pairs of numbers between the two groups to make their sums equal. Try to do this using the least number of moves. You could write each number on a small piece of paper.

Think what will happen to the sums if we interchange 2 and 5? Try interchanging other pairs of numbers and find the one that will make the sums equal.

(a)

	1	3
	2	4
	7	5
+	9	+ 9
	19	21

(b)

	5	9
	7	11
	12	13
+	15	+ 14
	39	47

(c)

	11	13
	15	17
	19	21
+	23	+ 25
	68	76

(d)

	77	81
	78	82
	79	83
+	80	+ 84
	314	330

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Fuel Arithmetic

Different vehicles need different quantities of fuel. This quantity can vary from 5 to 15 litres in the case of motorbikes, 15 to 50 litres in the case of cars, 150 to 500 litres in the case of lorries and trucks, and 5,000 litres in the case of a train.

Remember—We must save fuel as it is a limited resource. Reducing fuel usage also helps in cutting down pollution. Electric vehicles are now available that help conserve natural fuel and reduce pollution.

1. A lorry has 28 litres of fuel in its tank. An additional 75 litres is filled. What is the total quantity of fuel in the lorry?

   The total quantity of fuel in the tank is 28 *l* + 75 *l*.

Do you remember how to add two numbers using place value of numbers?

	H	T	O
	1	1	
		2	8
+		7	5
	1	0	1 3

Regroup, 10 Ones = 1 Ten

Let us try one more.

2. Find the sum of 49 and 89.

	H	T	O
		4	9
+		8	9

Let Us Solve

Add the following numbers. Wherever possible, find easier ways to add the pairs of numbers.

a. 15 + 79
b. 46 + 99
c. 38 + 35
d. 5 + 89
e. 76 + 28
f. 69 + 20

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Relationship Between Addition and Subtraction

1. Find the relationship between the numbers in the given statements and fill in the blanks appropriately.

   (a) If 46 + 21 = 67, then,
   67 – 21 = _____.
   67 – 46 = _____.

   (b) If 198 – 98 = 100, then,
   100 + _____ = 198.
   198 – _____ = 98.

   (c) If 189 + 98 = 287, then,
   287 – 98 = _____.
   287 – 189 = _____.

   (d) If 872 – 672 = 200, then,
   200 + _____ = 872.
   872 – _____ = 672.

2. In each of the following, write the subtraction and addition sentences that follow from the given sentence.

(a) If 78 + 164 = 242, then,
_____
_____.

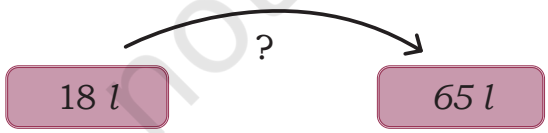
(b) If 462 + 839 = 1301, then,
_____
_____.

(c) If 921 – 137 = 784, then,
_____
_____.

(d) If 824 – 234 = 590, then,
_____
_____.

More Fuel Arithmetic

A minibus has 18 *l* of fuel left. After refuelling, the fuel meter indicates 65 *l*. How much fuel has been filled in the fuel tank of the minibus?



The quantity of fuel filled is 65 *l* – 18 *l*.

	T	O
	5	15
	6	5
–	1	8
	4	7

Regroup, 1 Tens = 10 Ones

Check if 18 + 47 = 65?

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Let Us Solve

1. What is the difference between 82 and 37?

	T	O
	8	2
–	3	7

Remember subtraction using place value? Try this.

Check your answer. Is 37 + ____ = 82?

2. 57 – 11 = _____
3. 23 – 19 = _____
4. 49 – 21 = _____
5. 56 – 18 = _____
6. 93 – 35 = _____
7. 84 – 23 = _____
8. 70 – 43 = _____
9. 65 – 47 = _____

Sums of Consecutive Numbers

Numbers that follow one another in order without skipping any number are called **consecutive numbers**. Here are some examples—

1, 2, 3, 4, 5 | 29, 30, 31, 32 | 512, 513 | 2023, 2024, 2025

Sum of 2 consecutive numbers.	Sum of 3 consecutive numbers.	Sum of 4 consecutive numbers.
1 + 2 = 3	1 + 2 + 3 = 6	1 + 2 + 3 + 4 = 10
2 + 3 = 5	2 + 3 + 4 = 9	2 + 3 + 4 + 5 = 14
3 + 4 = 7	3 + 4 + 5 = 12	3 + 4 + 5 + 6 = 18
4 + 5 = 9	4 + 5 + 6 = 15	4 + 5 + 6 + 7 = 22

1. In each of the boxes above, state whether the sums are even or odd. Explain why this is happening.
2. What is the difference between two successive sums in each box? Is it the same throughout?
3. What will be the difference between two successive sums for—
   (a) 5 consecutive numbers (b) 6 consecutive numbers

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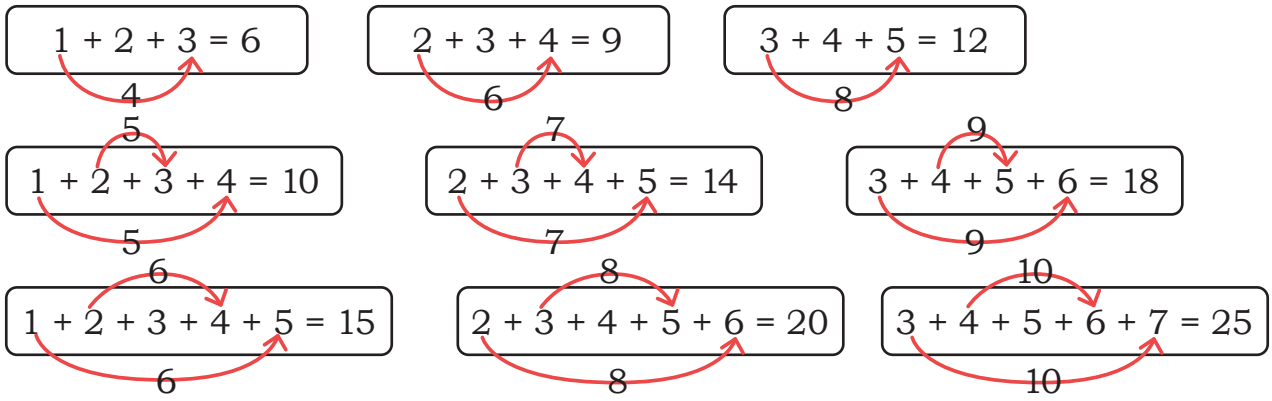
Let us see some more interesting patterns in sums.



Notice how the sums of 3, 4, and 5 consecutive numbers are related to the numbers being added. Use your understanding to find the following sums without adding the numbers directly.

(a) 67 + 68 + 69
(b) 24 + 25 + 26+ 27
(c) 48 + 49 + 50 + 51 + 52
(d) 237 + 238 + 239 + 240 + 241 + 242

The Longest Land Route—Adding Large Numbers

The longest distance one can travel by road is between Talon (in Russia) and Sagres (in Portugal). It is 15,150 km long.

In 2019, the North–South Corridor was the longest land route within India, starting from Srinagar in Jammu and Kashmir and ending at Kanniyakumari in Tamil Nadu. Do you know how long it was? Let us find out.

One of the places on the North–South Corridor was 1,855 km from Srinagar and 1,862 km from Kanniyakumari. What was the total length of the North–South Corridor in 2019?

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The total length of the North–South Corridor was 1,855 km + 1,862 km.

Do you remember how to add large numbers?

	Th	H	T	O
	(1)	(1)		
	1	8	5	5
+	1	8	6	2
	3	~~1~~ 7	~~1~~ 1	7

Regroup, 10 Tens = 1 Hundred

The total length of the North–South Corridor was 3,717 km in 2019.

Now, let us try finding the sum of 5-digit numbers.

Mahesh and his family decide to drive from Srinagar to Kanniyakumari. He spends ₹21,880 on fuel and toll tax, and ₹38,900 on other expenses during this journey. How much did he spend in total?

	TTh	Th	H	T	O
	(1)	(1)	( )	( )	
	2	1	8	8	0
+	3	8	9	0	0
	6	~~1~~ 0	~~1~~ 7	8	0

Adding larger numbers is the same as adding smaller numbers

If we keep the digits aligned—Ones below Ones, Tens below Tens, and so on, we do not need to label each place value.

	(1)	(1)	( )		
	2	6	7		
+		5	4		
	3	~~1~~	2	~~1~~	1

Mentally track the positions of the digits as you add.

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Let Us Solve

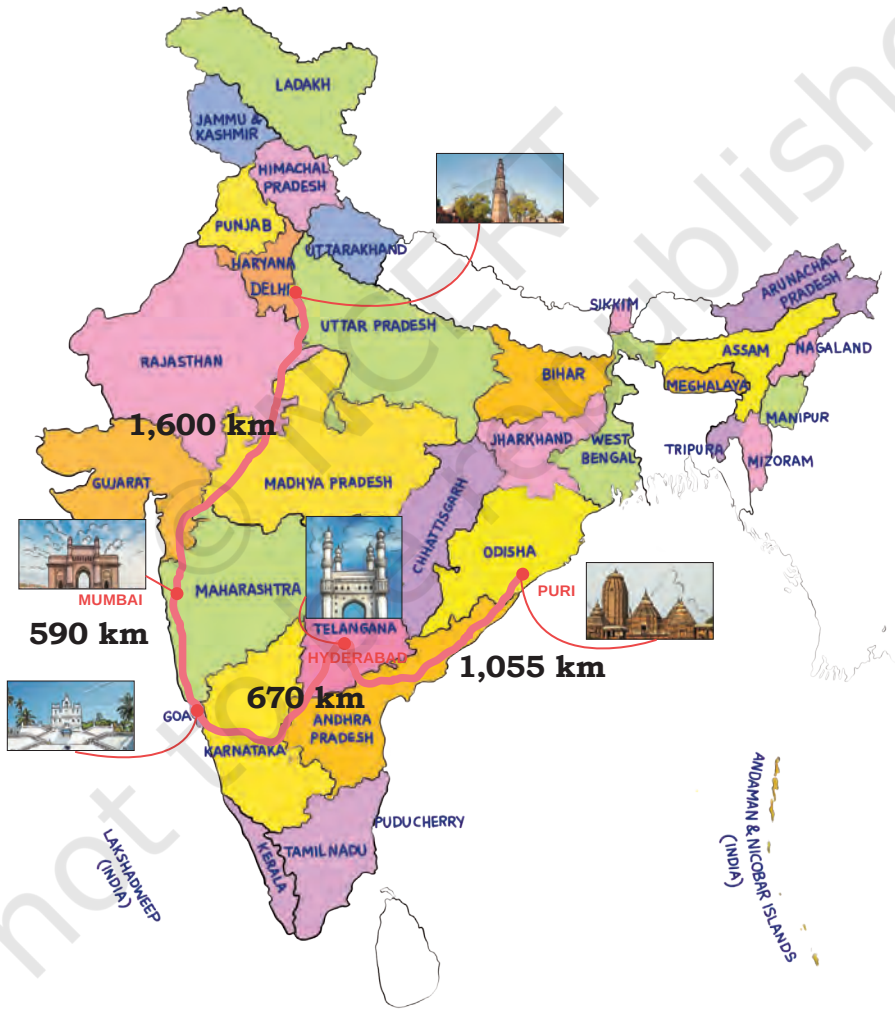
1. Find the following sums. Try not to write TTh, Th, H, T, and O at the top. Just align the digits properly, at least for the smaller numbers.

   (a) 238 + 367 (c) 12+123 (e) 878 + 8,789
   (b) 1,234 + 12,345 (d) 46,120 +12,890 (f) 1,749 + 17,490

2. The great Indian road trip!

Nazrana and her friends planned a road trip across India, starting from Delhi. They first drove to Mumbai, then Goa, then Hyderabad, and finally Puri.

Look at the distances marked on the map and help them find the total distance travelled.



3. Find 2 numbers among 5,205, 6,220, 7,095, 8,455, and 4,840 whose sum is closest to the following.

   (a) 10,000 (b) 15,000 (c) 13,000 (d) 16,000

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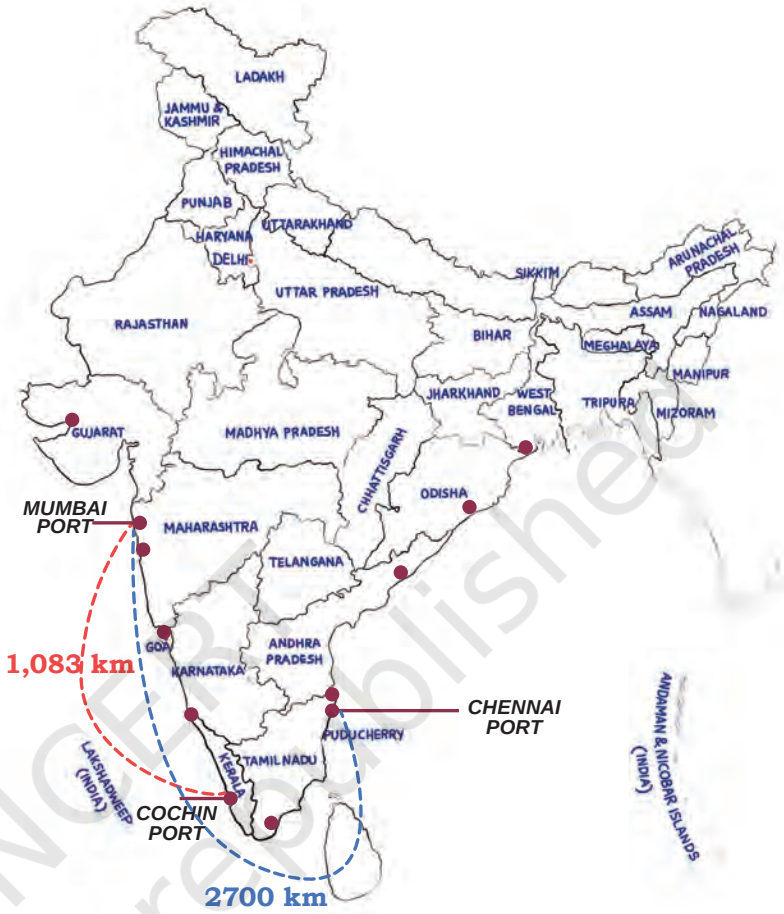
Subtracting Large Numbers

The place where passengers board a bus is called a bus stand or bus station.

Similarly, a railway station is the place where people board trains.

The place where people board ships is called a port.

The ports of Mumbai and Chennai are two of the important ports of India. Ships going from Mumbai to Chennai must pass by another important port—Cochin Port. Spot these places on the map of India.



The total distance of the sea route from Mumbai to Chennai is 2,700 km. A ship starting from Mumbai first reaches the Cochin port, travelling 1,083 km by sea. How much more distance does it have to travel to reach the Chennai port?

The remaining distance to be travelled by the ship is 2,700 km – 1,083 km.

Do you remember how to subtract numbers using place value?

	Th	H	T	O
		6	9	10
	2	7	0	0
–	1	0	8	3
	1	6	1	7

Regroup 1 H = 10 T. and 1 T = 10 O

Check if the solution is correct.

The ship has to travel 1,617 km more to reach Chennai.

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As you learnt earlier, the longest land route is 15,150 km between Talon (Russia) and Sagres (Portugal). The longest highway in Africa is 10,228 km long, connecting the cities of Cairo, in Egypt and Cape Town, in South Africa. How much longer is the land route between Talon and Sagres compared to the highway between Cairo and Cape Town?

The difference between the two roads is 15,150 km – 10,228 km.

	TTh	Th	H	T	O
		4	11	4	10
	1	~~5~~	~~1~~	~~5~~	~~0~~
–	1	0	2	2	8
	0	4	9	2	2

We subtract large numbers in the same way as smaller numbers.

Check if the answer is correct.

The land route connecting Talon and Sagres is 4,922 km or longer than the road connecting Cairo and Cape Town.

Like addition, here too we can try not to write the positions of the digits and align the numbers appropriately.

For example:

	5	10	13
	~~6~~	~~1~~	~~3~~
–	1	5	4
	4	5	9

Keep track of the position of the digits mentally.

Let Us Solve

1. Subtract the following. Try not to write TTh, Th, H, T, and O at the top. Align the digits carefully.

   (a) 4,578 – 2,222
   (b) 15,324 – 11,780
   (c) 5,423 – 423
   (d) 123 – 12
   (e) 77,777 – 777
   (f) 826 – 752

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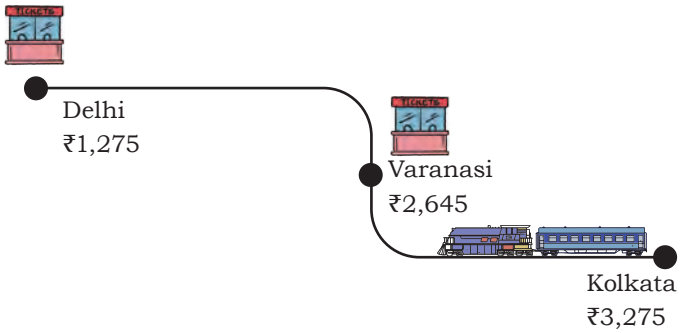
2. Mary's train journey to Delhi.

Mary is on a train journey. She starts from Kolkata with ₹12,540.

She spends ₹3,275 on food and other expenses during her trip to Varanasi. In Varanasi, her uncle gives her a gift worth ₹4,900. She then travels to Delhi, spending ₹2,645 on the train ticket. She spends ₹1,275 on souvenirs in Delhi. How much money is Mary left with at the end of the Delhi trip?



3. Members of a school council have raised ₹70,500. They plan to setup a Maths Lab with some games and models worth ₹39,785, buy library books worth ₹9,545, and purchase sports equipment worth ₹19,548.

   (a) Estimate whether the school council has raised enough money to make the purchases. Share your thoughts in the class.
   (b) Check your estimate with calculations.

4. A truck can carry 8,250 kg of goods. A factory loads 3,675 kg of cement and 2,850 kg of steel on it.

   (a) What is the total weight loaded onto the truck?
   (b) How much more weight can the truck carry before reaching its maximum capacity?

Quick Sums and Differences

Sukanta likes the numbers 10, 100, 1,000, and 10,000. He wants to figure out what number he should add to a given number such that the sum is 100 or 1,000. Help him fill in the blanks with an appropriate number.

32 + _____ = 100

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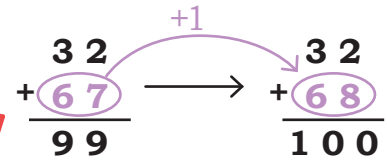
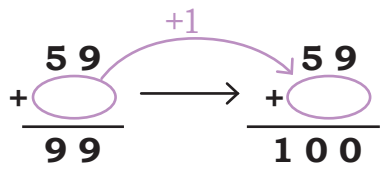
Sukanta's friend Piku shows him an interesting way to solve the problems.

Do you think this method will always work?



59 + _____ = 100

Try this method for the number 59.



Now, use this method to solve the following.

877 + _____ = 1,000 and 666 + _____ = 1,000
4,103 + _____ = 10,000 and 5,555 + _____ = 10,000

Will this method work if the units digit is 0? What do you think? What other methods can you use to find the missing number to fill in the blanks? Share your thoughts in the class.

(a) 180 + _____ = 1,000
(b) 760 + _____ = 1,000
(c) 400 + _____ = 1,000

Namita likes the number 9. She wants to subtract 9 or 99 from any number. Find a way to quickly subtract 9 or 99 from any number.

(a) 67 – 9 = _____
(b) 83 – 9 = _____
(c) 144 – 9 = _____
(d) 187 – 99 = _____
(e) 247 – 99 = _____
(f) 763 – 99 = _____

Now, use the above solutions to find answers to the following problems. Do not calculate again.

Namita wonders if she can get 9 or 99 as the answer to any subtraction problem. Find a way to get the desired answer.

(a) 32 – _____ = 9
(b) 56 – _____ = 9
(c) 877 – _____ = 99
(d) 666 – _____ = 99

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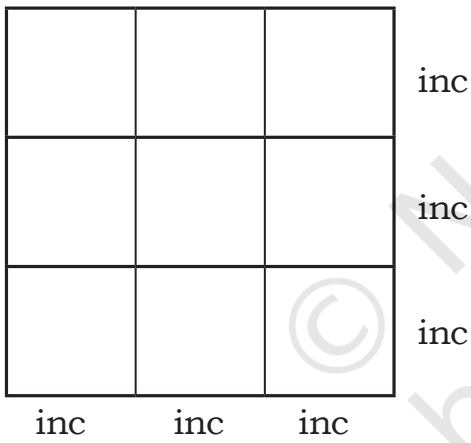
Let Us Think and Solve

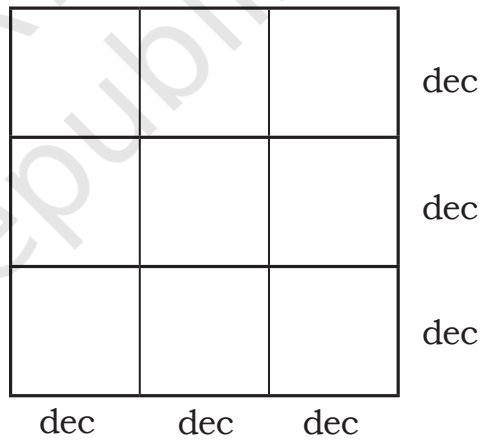
1. Nitin likes numbers that read the same when read from left to right or from right to left. Such numbers are called **palindrome numbers**. The numbers 22, 363, 404, and 8,558 are some examples.

   List all palindrome numbers between 100 and 200.
   List all palindrome numbers between 900 and 1,200.
   List all palindrome numbers between 25,000 and 27,000.

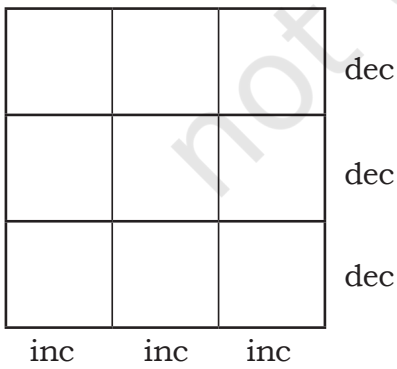
2. In a 3×3 grid, arrange the numbers 1 to 9 such that each row and each column has numbers in an increasing (inc) order. Each number should be used only once.

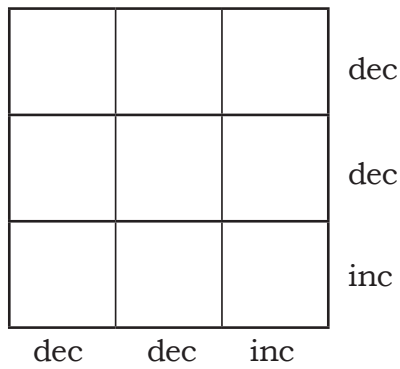


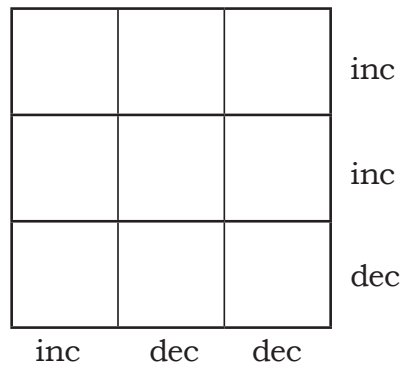
This time, fill the grid such that each row and column has numbers in decreasing (dec) order.



Now, fill the grids below with numbers (1–9) based on the inc (increasing) and dec (decreasing) conditions, as indicated below.







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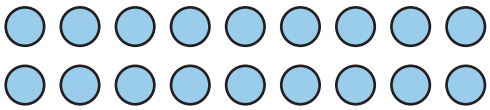
Even and Odd Numbers

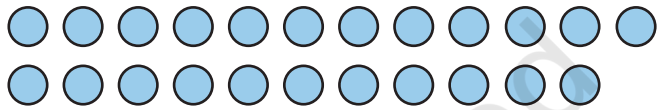
1. Circle the numbers that are even.

(a) 297	(e) 199	(i) 846
(b) 498	(f) 789	(j) 111
(c) 724	(g) 49	(k) 222
(d) 100	(h) 6,893	(l) 1,023

2. Observe the given arrangement.



Paired arrangement for 18



Paired arrangement for 23

Add 2 to 18. What changes or does not change in the arrangement?

Add 2 to 23. What changes or does not change in the arrangement?

3. What do you notice about the sums in each of the following cases? Do you think it will be true for all pairs of such numbers? Explain your observations. You may use the paired arrangement to explain your thinking.
   (a) 12 and 6 are a pair of even numbers. Choose 5 such pairs of even numbers. Add the numbers in each of the pairs.
   (b) 13 and 9 are a pair of odd numbers. Choose 5 such pairs of odd numbers. Add the numbers in each of the pairs.
   (c) 7 and 12 are a pair of odd and even numbers. Choose 5 such pairs of odd and even numbers. Add the numbers in each of the pairs.

Let Us Think

1. Jincy opened her piggy bank. She found 8 coins of ₹1, 9 coins of ₹2 and 5 coins of ₹5. She wants to buy stickers worth ₹38. What possible combination of coins can she use to pay the exact amount?

2. Raghu is fond of his grandfather's torch. He starts playing with it. He presses the switch once and the light turns ON. He presses it a second time and the light turns OFF. He presses the switch a third time and the light turns ON. He keeps doing this several times. Will the torch be ON or OFF after the 23rd press? How do you know?

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For what number of presses will the torch be ON? For what number of presses of the switch will the torch be OFF?

3. Mountain climbing

Priyanka Mohite is the first Indian woman to climb five Himalayan peaks above 8,000 metres. In addition to that, she has also climbed mountain peaks in other parts of the world. Read the table below and answer the questions that follow.

Mountain Range	Height (in metres)	Climbed in the Year
Mount Kanchenjunga (India and Nepal border)	8,586	2022
Mount Everest (Nepal–China border)	8,848	2013
Mount Makalu (China–Nepal border)	8,485	2019
Mount Lhotse (Tibet–Nepal border)	8,516	2018
Mount Kilimanjaro (Africa)	5,895	2016
Mount Elbrus (Russia)	5,642	2017
Mount Annapurna I (Nepal)	8,091	2021

(a) Which is the highest peak she climbed?
(b) What is the difference in height between the highest and lowest peaks she has climbed, as per the table.
(c) What is the difference between heights of Mount Elbrus and Mount Kanchenjunga?
(d) If Priyanka was 20 years old when she summited Mount Everest in 2013, in which year was she born?

The Tenzing Norgay National Adventure Award, formerly called the National Adventure Award is the highest adventure sports honour in India. Priyanka Mohite received this award in 2020.

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Math Metric Mela

A grand Math Metric Mela was held at the district level to celebrate young math whizzes. Every participating student was to receive a certificate of participation. The organisers got certificates printed for each district before the Mela. The number of certificates printed and the number of students who attended the competition in each district are as follows.

District	Certificates Printed	Students Attended
Chittoor, A.P.	18,225	18,104
Jaunpur, U.P.	19,043	19,265
Raigad, Maharashtra	20,863	19,974

For each district, find out if the number of certificates were sufficient?

If insufficient, calculate how many certificates fell short.

If extra, calculate how many certificates were in excess.

Let Us Do

1. Add.

   (a) 2,009 + 7,388
   (b) 26,444 + 71,111
   (c) 777 + 888
   (d) 1,234 + 1,234
   (e) 56 + 56,789
   (f) 777 + 77,777
   (f) 5,922 + 9,221
   (g) 4,321 + 8,765
   (h) 50,050 + 55,000

2. Subtract.

   (a) 458 – 226
   (b) 7,777 – 4,449
   (c) 65,447 – 47,299
   (d) 1,234 – 123
   (e) 12,345 – 1,234
   (f) 56,789 – 56
   (f) 87,326 – 11,111
   (g) 878 – 52
   (h) 749 – 222

3. Ambrish saved ₹92,375 over a year to buy cows and goats. He buys a cow for ₹26,000 and a goat for ₹17,000. He also buys a milking machine for ₹19,873. Does he have enough money to buy these? How much more or less does he have than he needs?

4. A factory produces 54,000 nuts and bolts in a day. An order is placed for 85,300 nuts and bolts. How many more nuts and bolts does the factory need to produce to complete the order?

5. Virat Kohli has scored 27,599 runs. He has 6,758 runs less than Sachin Tendulkar. How many runs has Sachin Tendulkar scored?

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Chapter 5

Far and Near

We have learnt about measuring length and some standard units we use to measure length. In this chapter we will learn some more units of measuring distances and the relationships between different units.

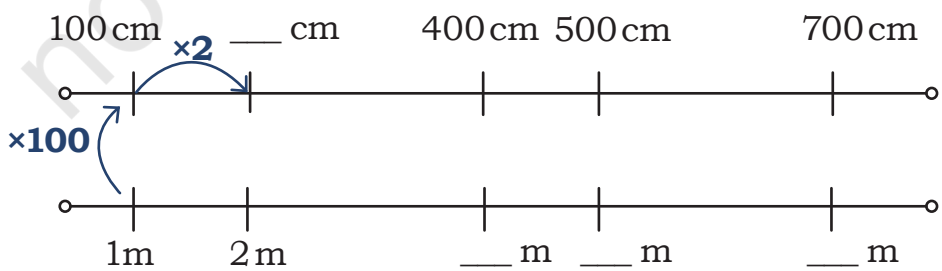
Let Us Find

Identify the appropriate units for measuring each of the following.

Quantity	Unit of measurement Metre (m) or centimetre (cm)
Height of India Gate	42
Length of a handkerchief	40
Depth of a well	50
Length of a mobile phone	13
Length of an elephant's trunk	2
Distance between two buttons on a shirt	5

Different Units but Same Measure

Shikha and Sonu are measuring the lengths of saris and stoles in the village weaving centre. Find which measures represent the same sari or stole. You can take help of the double number line below.



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204 cm	5 metre 40 cm
540 cm	2 metre 204 cm
750 cm	2 metre 4 cm
240 cm	2 metre 40 cm
404 cm	6 metre 150 cm

Let Us Compare

1. Ritika is comparing the lengths of different rods. Compare them using <, =, > signs.
   (a) 456 cm ____ 5 m
   (b) 55 cm + 200 cm ____ 200 cm + 54 cm
   (c) 6 m 5 cm ___ 6 m 50 cm
   (d) 2 m 150 cm ___ 3 m 50 cm
   (e) 238 cm ____ 138 cm + 1 m

2. World's tallest statue
   (a) What is the difference between the height of the tallest statue in the world and the Statue of Liberty?
   (b) Identify the statues whose heights have the least difference.
   (c) Identify the statues whose heights have the largest difference.
   (d) The height of which statue will be equal to the height of the Statue of Unity, if it is doubled?

Some of World's Tallest Statues

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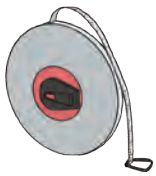
Measuring Long Distances

Here are some ways in which you can measure long distances.

Long Tape



Rodometer—measuring wheel

Rangefinder

Laser Distance Meter

Let Us Do

Measure 100 m and 200 m on your school playground, or any other place in and around your school, using a Long Tape. Mark these points and draw a straight line. Walk on the lines and count the number of steps. Use this relationship between the number of steps taken and distance walked to find distances around you for at least 3 locations. Wherever possible, walk and find the number of steps. Otherwise, find the distance and estimate the number of steps.

(a) Identify and write the locations that are the nearest and the farthest from your home.

Nearest location _____.

Farthest location _____.

(b) Write the distances obtained above in increasing order.

_____, _____, _____, _____.

(c) Name a location that is equal to or more than 1,000 m from your home.

Let Us Explore

When we walk 1,000 m, we say we have walked 1 km.

1,000 m = 1 km

Kilo stands for thousand. This unit is used to measure long distances.

Length of rope	Number of ropes needed to make 1 km
1,000 m	1
100 m	
10 m	
200 m	
500 m	
250 m	

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Kilometre Race

Sheena and Jennifer are helping to organise a 3-km race. Help them with the arrangements for the race.

1. Water stations are to be arranged after every 500 m. How many water stations must be set up? At what positions from the starting point will these water stations be placed?
2. Children need to stand at an interval of 300 m to direct the runners. How many children are needed? At what positions from the starting point will the children be standing?
3. Red and blue flags are to be placed alternately at every 50 m. How many red and blue flags are needed till the finish line?

Let Us Do

Longest Train Journey

The longest train journey in India is by The Vivek Express which runs from Dibrugarh in Assam to Kanniyakumari in Tamil Nadu. Look at the stations on the route shown in the table below and answer the questions.

Station number	Name of the station	Distance from Dibrugarh
9	Dimapur	306 km
14	Guwahati	556 km
22	Jalpaiguri Road	983 km
34	Bhubaneswar	2,007 km
40	Visakhapatnam	2,450 km
45	Vijayawada JN	2,800 km
55	Coimbatore JN	3,675 km
65	Kanniyakumari	4,187 km

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1. The total length of the route from Dibrugarh to Kanniyakumari is _____ km.
2. The distance between Vijayawada and Jalpaiguri road is _____.
3. Distance between Vijayawada and Visakhapatnam is _____.
4. Which two stations are farther apart—Guwahati and Dimapur or Bhubaneswar and Jalpaiguri Road?
5. What is the distance between Guwahati and Coimbatore JN?

Let Us Explore

The World of Small Things

How can we measure small things like the ones shown here?

sprout

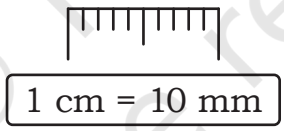
small screws

nail

Let us look at the scale. Do you notice the small marks between 1 cm and 2 cm? Count how many marks are there between 1 cm and 2 cm?

One centimetre is divided into ten equal parts. Each part is called 1 millimetre (mm).

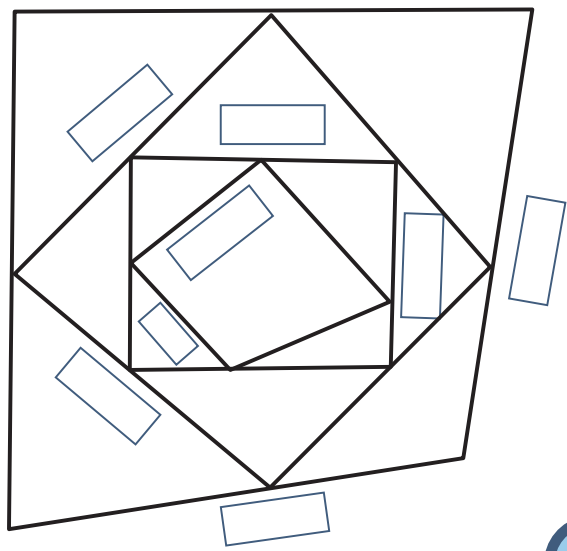
1 cm = 10 mm



These small marks between any two centimetre marks help us measure the smaller lengths. Thus, it adds to the precision in measurement.

Let Us Measure

Measure the lines in the design and write their measurements in cm and mm.



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Let Us Do

Soak some seeds of whole moong or black or white chana overnight. Next morning, take them out and wrap them in a moist cloth to sprout them. Over the next 4 days, take out one seed each day and measure the length of sprout. For ease of measurement, you can either place the seed on a paper and mark the length of the sprout, or use a thread to find its length.

Number of days	Length of the sprout (in mm)
Day 1	
Day 2	
Day 3	
Day 4	

Let Us Draw

Draw lines of the following lengths in your notebook using a scale.

1. 5 cm 5 mm
2. 3 cm 6 mm
3. 8 cm 3 mm
4. 36 mm
5. 67 mm

How did you draw lines of lengths 36 mm and 67 mm? Share your thoughts in class.

Relationships between Different Units

10 mm = 1 cm
100 cm = 1 m
1,000 m = 1 km

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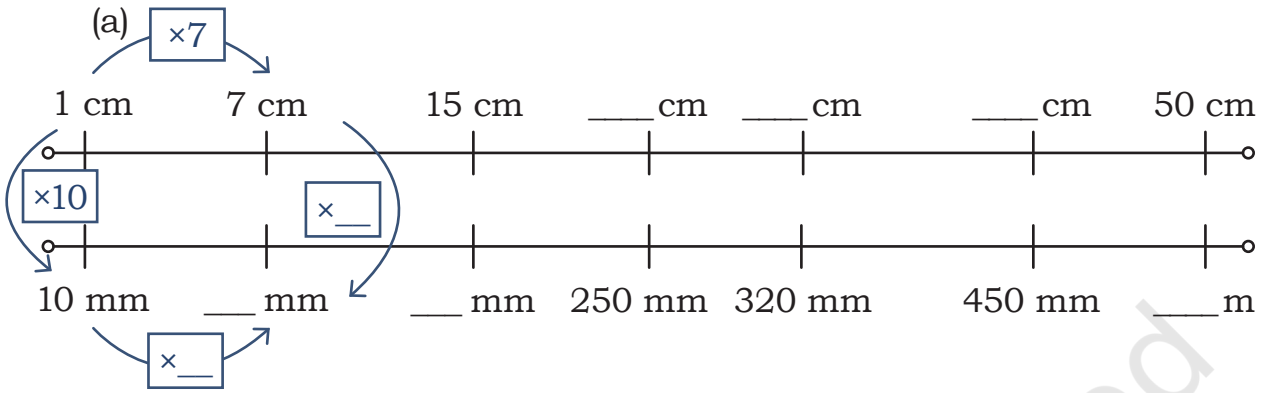
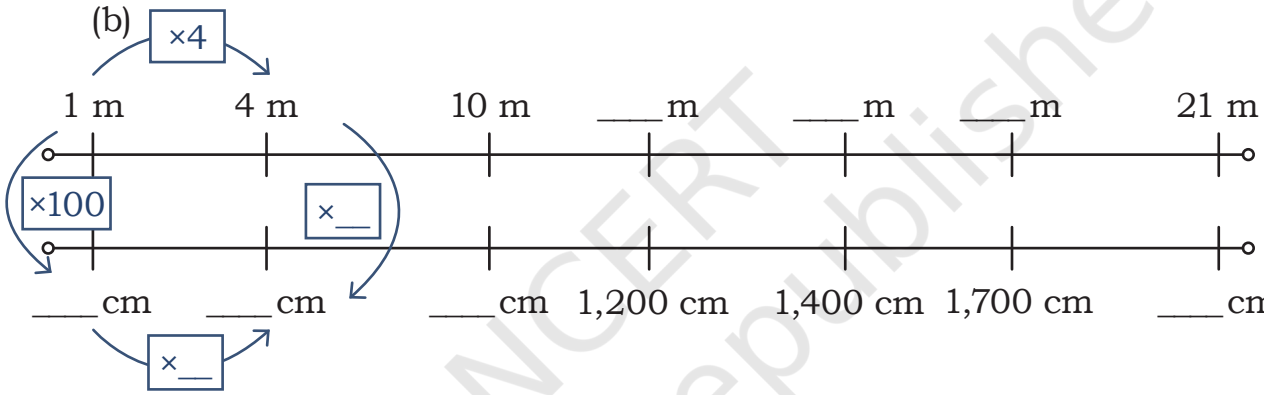
Let Us Do

1. Fill in the blanks appropriately in the double number lines given below.

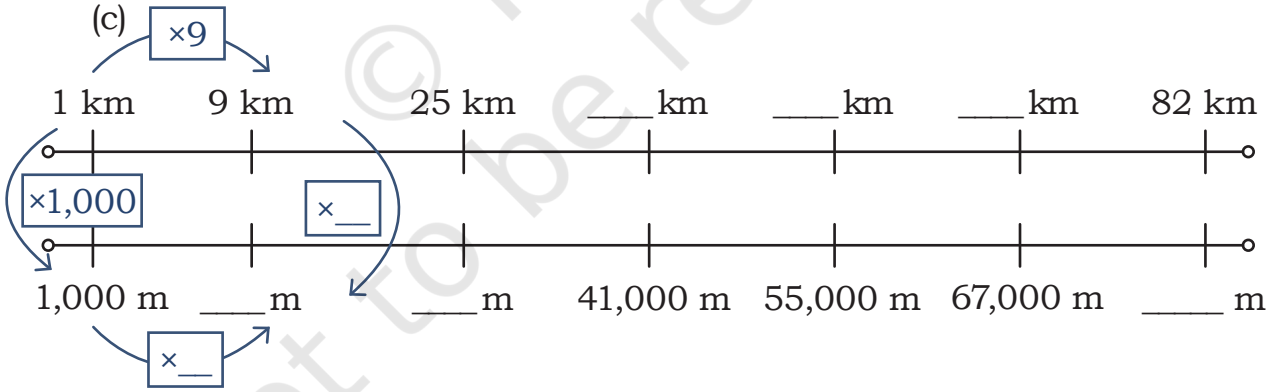
(a)



(b)



(c)



2. Use your understanding from above to fill in the blanks appropriately.
   (a) 4 cm 5 mm = _____ mm
   (b) 89 mm = ___ cm ___ mm
   (c) 234 cm = ___ mm
   (d) 514 mm = ___ cm ___ mm
   (e) 6 m 34 cm = ___ cm
   (f) 20 m 12 cm = ___ cm
   (g) 397 m = _____ cm

89 mm = 80 mm + 9 mm
= 8 cm 9 mm

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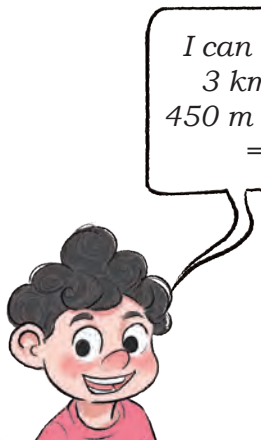
(h) 5,792 cm = _____m _____ cm
(i) 9,108 cm = _____ m _____ cm
(j) 34 km = _____ m
(k) 6,870 m = ____ km ____ m
(l) 10,552 m = ____ km ___ m
(m) 29 km 30 m = ____ m
(n) 32 km 359 m = ____ m

5,792 cm = 5,700 cm + 92 cm
= 57 m 92 cm

Adding and Subtracting Lengths

Saji saw on his smartphone that he walked 3 km 450 m in the morning and another 4 km 650 m in the evening. How much did he walk in the whole day? How would you solve this problem? Share your thoughts in class.



I can add similar units.
3 km + 4 km = 7 km.
450 m + 650 m = 1,100 m
= 1 km 100 m.

	km	m		
		1		
	3	4	5	0
+	4	6	5	0
	7	1 1	1	0 0

1,000 m = 1 km

7 km + 1,100 m = 8 km + 100 m = 8 km 100 m

I can convert everything into metres and add, that is 3,450 m + 4,650 m

	m			
	1	1		
	3	4	5	0
+	4	6	5	0
	8	1 1	1	0 0

8,100 m = 8,000 m + 100 m
= 8 km 100 m

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Electricians are changing the cables in a house. They need 63 m of cable for this purpose. They used 16 m 75 cm cable in the first room.
What is the length of the cable left?

Convert 1 m = 100 cm

Convert the quantities in cm.
6,300 cm – 1,675 cm

	cm			
	5	12	9	10
	~~6~~	~~3~~	~~0~~	~~0~~
–	1	6	7	5
	4	6	2	5

4625 cm = 4600 cm + 25 cm = 46 m 25 cm.

We can also subtract like units, as above.

	m		cm			m		cm		
		2				5	12	0	9	10
	6	~~3~~	1	0	0	~~6~~	~~3~~	~~1~~	~~0~~	~~0~~
–	1	6		7	5	– 1	6		7	5
						4	6		2	5

Therefore, 46 m 25 cm cable is left.

Note for the Teachers: Lengths can be added and subtracted in different ways. We can orally calculate whenever the numbers are convenient, like 200, 250, 400, 500, or 750, etc. In fact, we should encourage the use of mental strategies so that students can use mathematics for solving daily-life problems. When numbers are not suitable for oral calculations, the learners can choose one of the column strategies provided here based on their comfort. Help learners notice the similarity between operations on numbers and on quantities like length.

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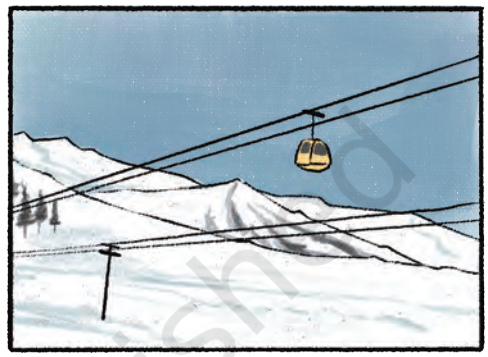
Let Us Do

1. Rani has two red-coloured ribbon rolls, one of length 3 m 75 cm and another 2 m 25 cm long. How much ribbon does she have?

2. The distance from Bhopal to Sanchi is 48 km 700 m. Bhadbhada Ghat waterfall is on the way, and 17 km 900 m away from Bhopal. How far is Sanchi from the waterfall?

3. Gulmarg Gondola in Gulmarg, Kashmir is the second longest and second highest cable car in the world. It is divided into two sections. The first section covers 2 km 300 m and the second section covers 2 km 650 m. What is the total distance covered by the cable car?



4. Circle the bigger length and find the difference.

(a) 11 mm and 1 cm	Difference — _____
(b) 26 mm and 2 cm	Difference — _____
(c) 20 cm and 201 mm	Difference — _____
(d) 1,020 mm and 1m	Difference — _____
(e) 2 m and 245 cm	Difference — _____
(f) 5,678 m and 6 km	Difference — _____
(g) 6 km 1,480m and 7 km 479m	Difference — _____

Multiplying and Dividing Lengths

1. We need a 1 m 80 cm cloth to make a shirt for a 10-year old child. How much cloth will be needed to make shirts for 20 such children?

20 × 1 m 80 cm = 20 × 1 m and 20 × 80 cm
= 20 m + 1600 cm
= 20 m + 16 m
= 36 m.

Break the quantity into m and cm and multiply. You can also convert it into cm and multiply.

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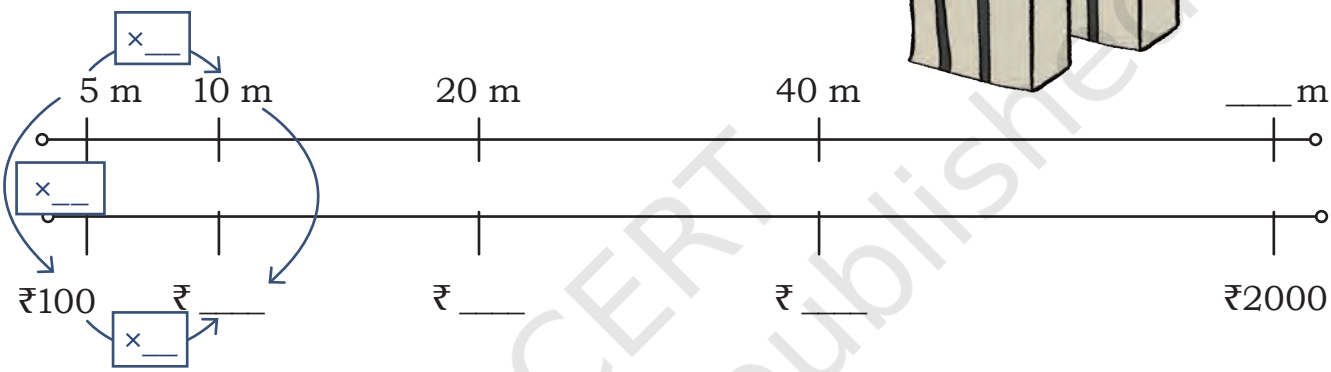
2. A shop sells cloth for making bags at ₹100 for 5 m. How much money is needed to buy a 1 m cloth?

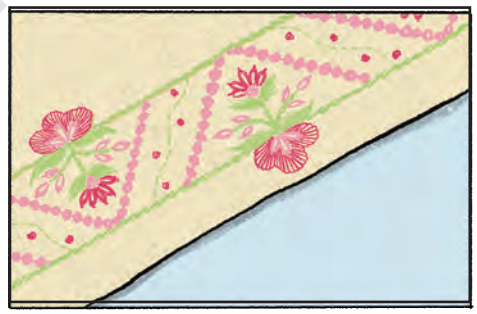
If 5 m cloth costs ₹100, then a 1 m cloth costs 100 ÷ 5 = ₹20.

Now, use the double number line to find the cost of the cloth or the length of cloth that we can buy at a particular cost.



3. Anita is making an embroidery on the border of a sari. She needs a 1 m long thread to embroider a 50 cm sari. How much thread would she need for a 5 m sari border?

A 1 m long thread costs ₹50. How much money will be needed to buy the thread?



4. A road 12 km 600 m long is being laid in a town. The workers lay an equal length of road each day, and complete the work in 6 days. How much road-laying work is done on each day?

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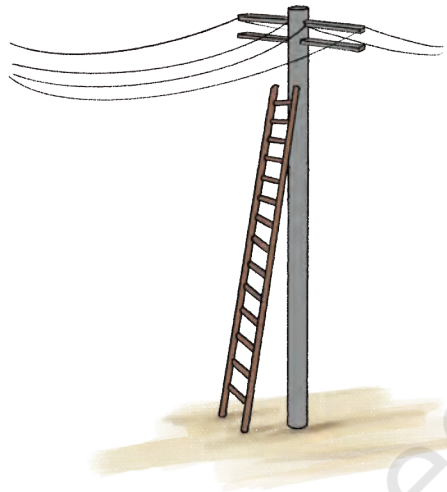
Let Us Estimate

Height of a single-storeyed house



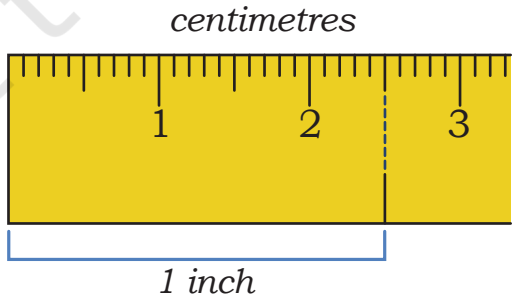
Height of an electric pole

Estimate the following. Share your reasoning in class.

1. The height of the tallest building in your neighbourhood. What did you use as a reference to estimate the height?
2. The height of the tallest tree in your neighbourhood. What did you use as a reference?
3. The depth of a well or swimming pool in your neighbourhood. How did you find out?

Let Us Explore

In daily life, we use other units of measuring length as well. Height is usually measured in feet and inches. Look at your ruler to see if inches are also marked on it. Find out how many cm and mm equal 1 inch.



1 inch = 2 cm 5 mm

1 foot = 12 inches or 30 cm.

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Measure Your Height

Stand against a wall and mark your height. Measure the distance between the floor and the marked point in feet and inches.

Similarly, other students in the class can also measure their heights.

Find out who is the tallest student in your class. What is his or her height in feet and inches?

Try This

Put appropriate operation sign (+, –, ×, ÷) such that each row and column and each 4 × 4 box should not repeat the sign.

÷			+
	×		
		+	
			–

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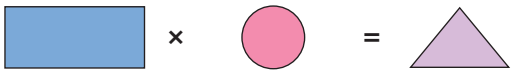
Chapter

6 The Dairy Farm

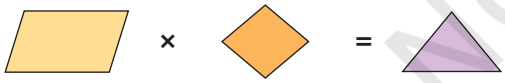
By now, we know several multiplication facts. We have also learnt how to multiply two numbers. We will continue to explore different ways of multiplying in this chapter.

Let Us Think

1. The given shapes stand for numbers between 1 and 24. The same shape denotes the same number across all problems. Find the numbers hiding in all the shapes.

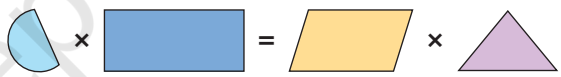
a) 

b)

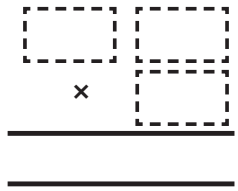
c) 

d)

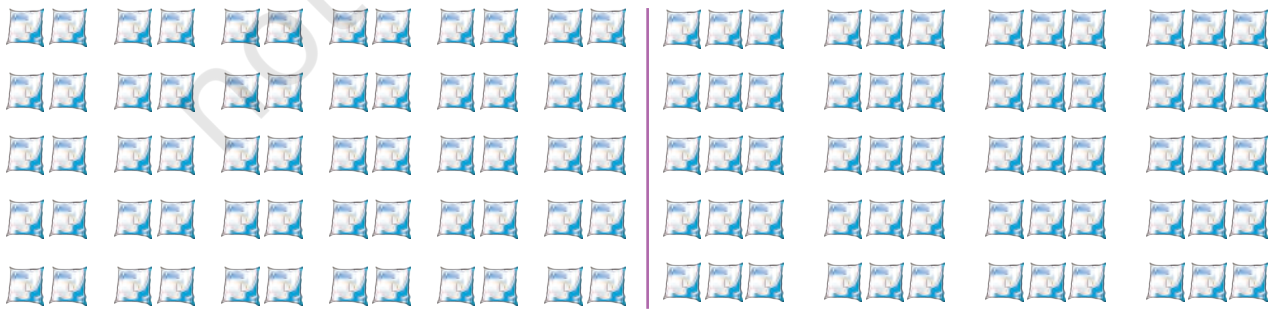
e)

f) 

2. Place the digits 2, 5, and 3 appropriately to get a product close to 100. Share your reasoning in class.



3. A dairy has packed butter milk pouches in the following manner. Find the number of pouches kept in each arrangement. One is done for you.



30 × 2 = 60

___ × ___ = 60

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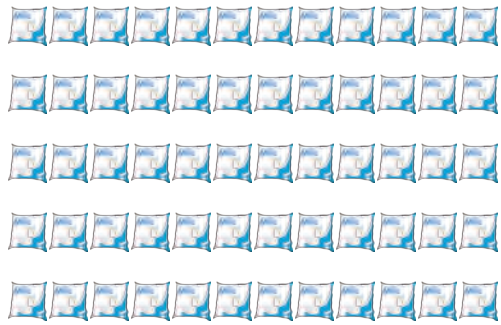
___ × ___ = **60**



___ × ___ = **60**

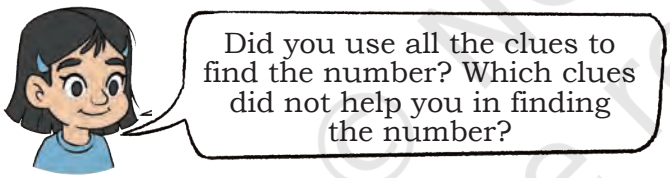
What other groups can you make?

4. Which number am I?

I am a two-digit number. Find me with the help of the following clues.

(a) I am greater than 8.
(b) I am not a multiple of 4.
(c) I am a multiple of 9.
(d) I am an odd number.
(e) I am not a multiple of 11.
(f) I am less than 50.
(g) My ones digit is even
(h) My tens digit is odd.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99



5. Make your own numbers.

Choose any two numbers and one operation from the grid. Try to make all the numbers between 0 and 20. For example, 2 can be formed as 4 – 2. Could you make all the numbers?

100	25	5	–
10	2	36	×
12	4	3	+
			÷

Which numbers could you not make? Is it possible to make these numbers using three numbers? You can use two operations, if needed. Which numbers between 0–20 can you get in more than one way?

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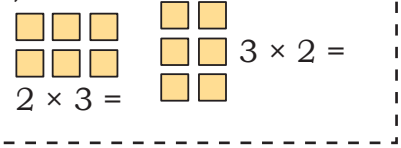
Order of Numbers in Multiplication

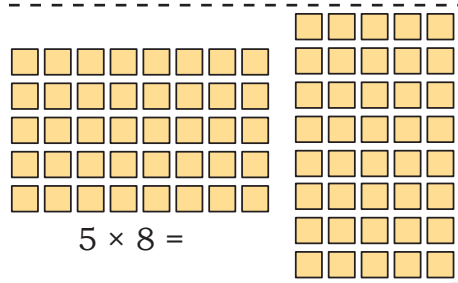
Daljeet Kaur runs a milk processing unit. She has arranged the butter packets in the following ways. Find the number of butter packets in each case. What pattern do you notice (or observe)? Discuss in class.

a)



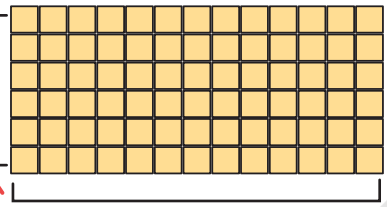
2 × 3 = 3 × 2 =

b)



5 × 8 = 8 × 5 =

Number of groups: 6



Group size: 13

6 × 13 =
13 × 6 =

e) 10 × 5 =
5 × 10 =

f) 8 × 20 =
20 × 8 =

g) 12 × 9 =
9 × 12 =

What is 9 × 0? 0 × 9?

Is this true for the product of any two numbers? Discuss in class.

The number of groups and the group size are interchanged in each case above, but the total number of butter packets remain the same.

Patterns in Multiplication by 10s and 100s

1. Let us revise multiplication by 10s and 100s.

a) 4 × 10 = ____
b) 20 × 10 = ____
c) 10 × 40 = ____
d) 10 × 10 = 100
e) 20 × 50 = ____
f) 80 × 10 = ____
g) 3 × 100 = 100 × 3 = 300
h) 8 × 100 = ____ = ____
i) 10 × 100 = ____ = ____

Note for Teachers: Encourage the learners to understand that when we multiply a number by 10, it becomes 10 times, and each digit moves one place value to the left. Multiplying by 100 makes the number 100 times larger, shifting each digit two place value to the left. Let them notice the pattern of zeros in the place value table.

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2. Find answers to the following questions. Fill in the table below and describe the pattern. Discuss in class.

100 × 90 = __,000	400 × 10 = ___	60 × 50 = ____
30 × 20 = 600	700 × 4 = _,_ 00	10 × 45 = ____

30 × 10 = 300
×2 ↓ ×2
30 × 20 = 600
Notice the underlined numbers

30 × 20 =
3 × 10 × 2 × 10 = 6 × 100

Notice the underlined numbers. Remember, we can multiply numbers in any order.

How should we write 450 in the table below?

Problem	Th	H	T	O
10 × 45 =				
30 × 20 =		6	0	0
400 × 10 =				
700 × 8 =				
100 × 90 =	9	0	0	0

Problem	Th	H	T	O
60 × 50 =				
220 × 20 =				
11 × 300 =				

Problem	Th	H	T	O
80 × 90 =				
10 × 63 =				
40 × 12 =				

What will happen if we multiply numbers by 1,000?

2 × 1,000 = 2 thousand = 2,000 [1,000] [1,000]

5 × 1,000 = 5 thousand = 5,000 [1,000] [1,000] [1,000] [1,000] [1,000]

10 × 1,000 = 10 thousand= 10,000 20 × 1,000 = 20 thousand = 20,000

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Let us fill in the table and observe the patterns.

Problem	TTh	Th	H	T	O
2 × 1,000 =		2	0	0	0
5 × 1,000 =		5	0	0	0
10 × 1,000=	1	0	0	0	0
20 × 1,000=	2	0	0	0	0
3 × 5,000 =					
8 × 3,000 =					
5 × 7,000 =					

Problem	TTh	Th	H	T	O
20 × 100 =					
40 × 500 =					
60 × 300 =					
600 × 30 =					
80 × 900 =					
70 × 600 =					
5 × 7,000 =					

Many Ways to Multiply

What is **18** × **5**

Do you think they are all correct? Why do you think so?

Half of 18 is 9. 9×5 is 45 and 9×5 is 45. I added 45 and 45 together to get 90.

First, I doubled 18 to get 36. Then I doubled 36 to get 72 and then I added 18 to 72 to get 90.

I separated 18 into 8 and 10. 8×5 is 40. 10×5 is 50. then I added 40 and 50 together to get 90.

18×5 = 9×10. So, 90.

I did 20×5, which is 100. Then I took away 2×5, which is 10. So, 100–10 = 90.

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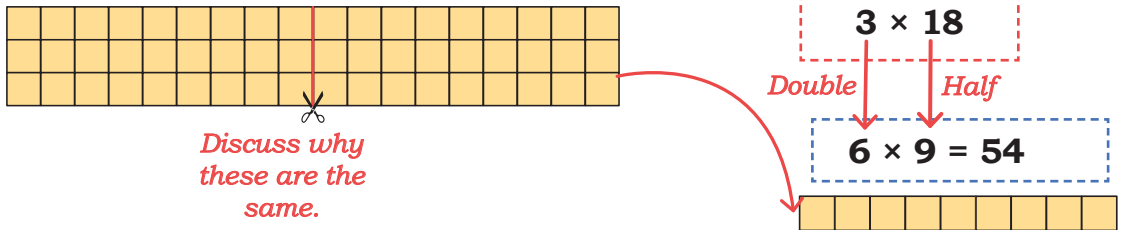
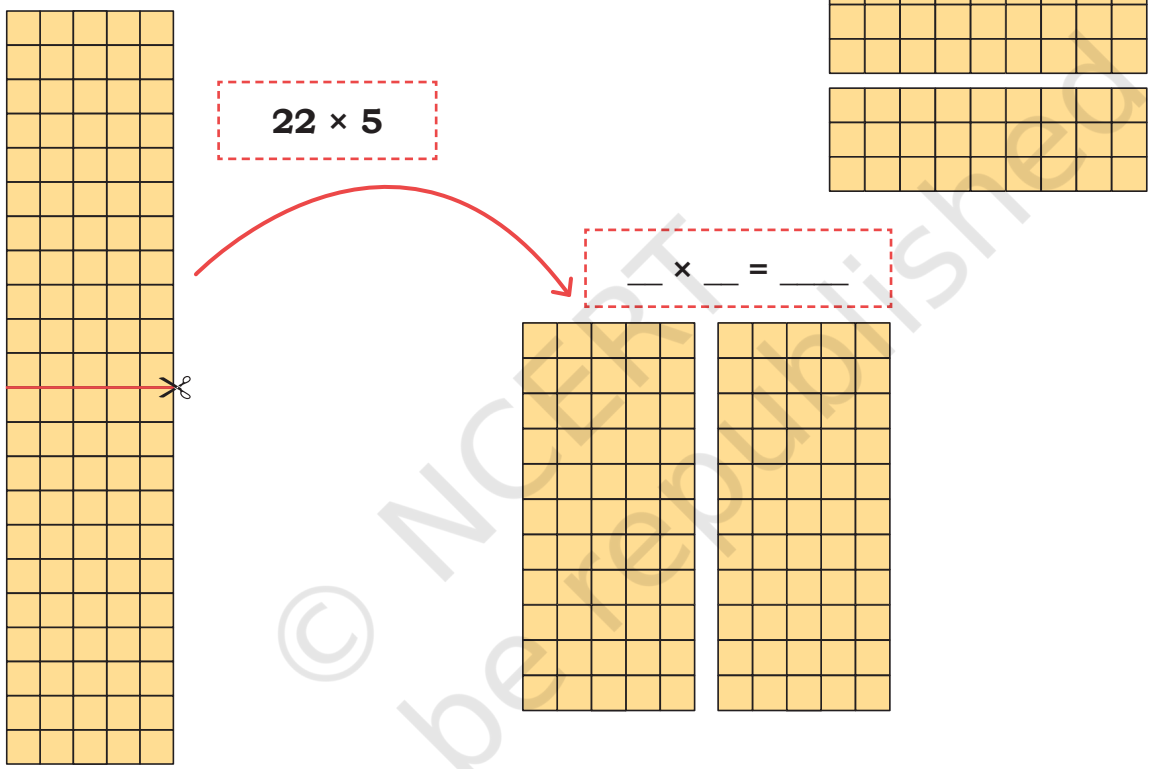
Doubling and Halving

Butter packets are arranged in the following ways. Let us find some strategies to calculate the total number of packets.

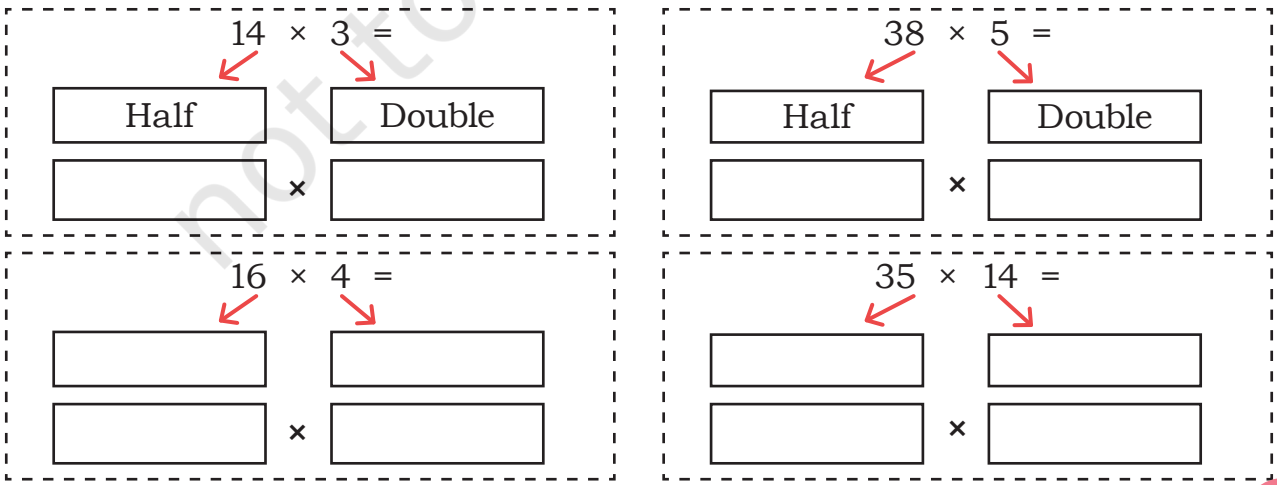
a)



b)



c) Solve the following problems like the previous ones.



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This halving and doubling strategy works well when we have to multiply with numbers like 5 and 25. Discuss why?

(d) Find the product by halving and doubling either the multiplier or the multiplicand.

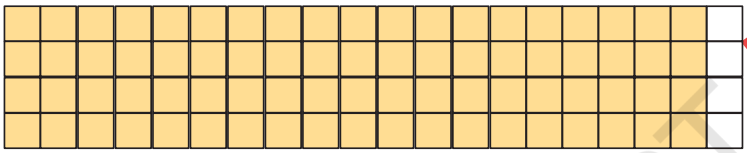
1) 5 × 18 2) 50 × 28 3) 15 × 22

4) 25 × 12 5) 12 × 45 6) 16 × 45

(e) Give 5 examples of multiplication problems where halving and doubling will help in finding the product easily. Find the products as well.

Nearest Multiple

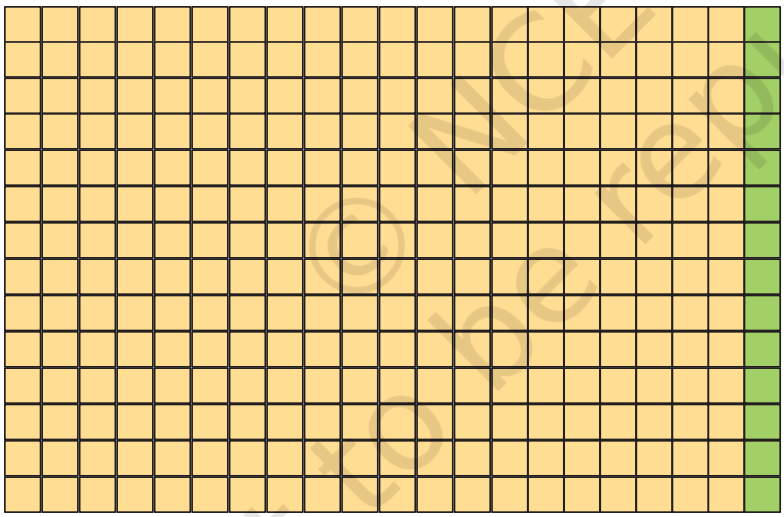
(a) 4 × 19



Observe the picture and find why we need to subtract 4

4 × 19 = 4 × 20 – 4
= 80 – 4
= 76

(b) 14 × 21



Observe the picture and find why we need to add 14.

14 × 21 = 14 × 20 + 14
= 280 + 14
= 294

(c) Give 5 examples of problems where you can use the nearest multiple to find the product easily. Find the products as well.

(d) Find the products of the following numbers by finding the nearest multiple.

1) 7 × 52 2) 12 × 28 3) 75 × 31

4) 99 × 15 5) 8 × 25 6) 22 × 42

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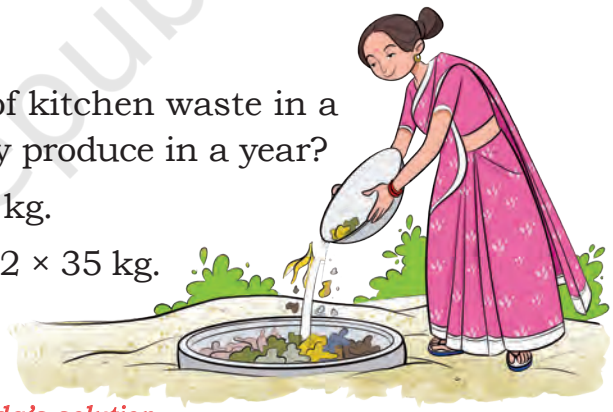
Let Us Solve

Use strategies flexibly to answer the following questions. Discuss your thoughts in class.

1. A school has an auditorium with 35 rows, with 42 seats in each row. How many people can sit in this auditorium?
2. Priya jogs 4 kilometres every day. How many kilometers will she jog in 31 days?
3. A school has received 36 boxes of books with 48 books in each box. How many total books did the school receive in the boxes?
4. Priya uses 16 metres of cloth to make 4 kurtas. How much cloth would she need to make 8 kurtas?
5. Gollappa has 29 cows on his farm. Each cow produces 5 litres of milk per day. How many litres of milk do the cow produce in total, each day?
6. Maska Cow Farm has 297 cows. Each cow requires 18 kg of fodder per day. How much total fodder is needed to feed 297 cows every day?

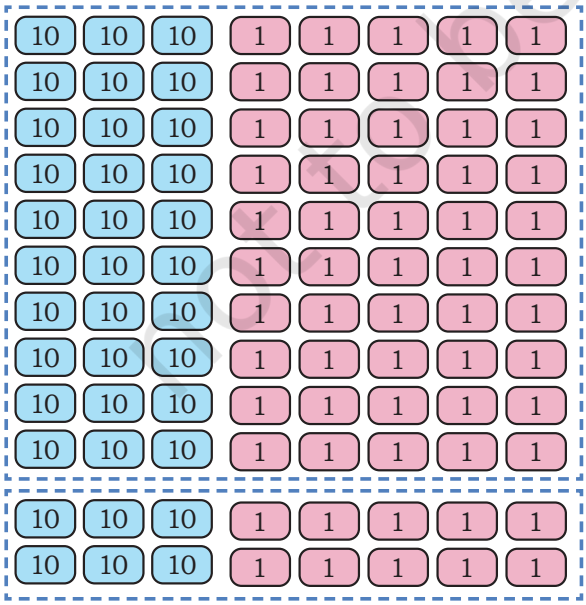
Waste and Composting

1. A family of 4 produces around 35 kg of kitchen waste in a month. How much waste will the family produce in a year?



Quantity of kitchen waste in 1 month is 35 kg.

Quantity of kitchen waste in 12 months is 12 × 35 kg.



Nida's solution

×	30 kg	5 kg
10	300	50
2	60	10
	360	60
	420	

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Kanti and John tried to solve it in the following ways.

Kanti's solution

$$
\begin{array}{r}
35\ (30+5) \\
\times\ 12\ (10+2) \\
\hline
10\ (2\times 5) \\
60\ (2\times 30) \\
50\ (10\times 5) \\
300\ (10\times 30) \\
\hline
420
\end{array}
$$

John's solution

$$
\begin{array}{r}
35\ \ (30+5) \\
\times\ 12\ \ (10+2) \\
\hline
60+10\ =\ \ 70\ (2\times 35) \\
300+50\ =\ 350\ (10\times 35) \\
\hline
=\ 420
\end{array}
$$

The family produces _____ kg of waste in a year.

How are these solutions same or different? Discuss in class.

2. The family regularly composts the collected waste. They get around 150 kg of compost each year, which they use in their garden. 1 kg of compost is often sold in the market at ₹24. By creating their own compost, how much money have they saved in a year?

   Savings on 1 kg compost is ₹24. Savings on 150 kg will be ₹24 × 150.

×	100	50
20	2,000	1,000
4	400	200
	2,400	1200
	3,600	

The family saves ₹3,600.

$$
\begin{array}{r}
150\ (100+50) \\
\times\ \ 24\ (20+4) \\
\hline
200\ (4\times 50) \\
400\ (4\times 100) \\
1{,}000\ (20\times 50) \\
2{,}000\ (20\times 100) \\
\hline
3{,}600
\end{array}
$$

Another way:

$$
\begin{array}{r}
150\ (100+50) \\
\times\ 24\ (20+4) \\
\hline
400+\ \ 200+0=\ \ 600\ (4\times 150) \\
2{,}000+1{,}000+0=3{,}000\ (20\times 150) \\
\hline
=\ 3{,}600
\end{array}
$$

Note for Teachers: Help the learners see the similarities and differences between the solutions. Let them discuss and identify the more efficient solution. Draw the similarities between the steps, especially highlighting the place values of the digits, and multiplication by 10s and 100s in each step.

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Let Us Multiply

(a) 32 × 8

×	30	2
8		

```
   32 (30 + 2)
×   8
-------------
 ____ (8 × 2)
    0 (8 × 30)
-------------
  256
```

```
      32 (30 + 2)
     × 8
-------------
___ 0 + 16 = 256
```

(b) 69 × 45

×	60	9
40		
5		
	2700	405
	3105	

```
   69 (60 + 9)
×  45 (40 + 5)
-------------
   45 (5 × 9)
___ 0 (5 × 60)   ←
___ 0 (40 × 9)
   00 (40 × 60)
-------------
3,105
```

```
                 69 (60 + 9)
               × 45 (40 + 5)
-------------------------------
300 + __   =   345 (5 × 69)
____ + ___  = 2760 (40 × 69)
-------------------------------
            = 3,105
```

Let Us Do

1. Solve the following problems like Nida did.

a) 78 × 4

×		

b) 83 × 9

×		

c) 67 × 28

×		

d) 53 × 37

×		

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2. Solve the following problems like Kanti.

a) 94 × 5 b) 49 × 6 c) 37 × 53 d) 28 × 79

3. Solve the following problems like John.

a) 86 × 3 b) 72 × 7 c) 94 × 36 d) 66 × 22

4. Solve the following problems:

(a) A movie theater has 8 rows of seats, and each row has 12 seats. If half the seats are filled, how many people are watching the movie? If 3 more rows get filled, how many total people will be there?

(b) In a test match between India and West Indies, the Indian team hit twenty-four 4s and eighteen 6s across the two innings. How many runs were scored in 4s and 6s each? 234 runs were made by running between the wickets. If 23 runs were extras, how many runs were scored by Indian team in the two innings?

(c) Anjali buys 15 bulbs and 12 tube lights from Sudha Electricals. Each bulb costs ₹25 and each tube light costs ₹34. How much money should Anjali give to the shopkeeper?

(d) A shopkeeper sold 28 bags of rice. Each bag costs ₹350. How much money did he earn by selling rice bags?

(e) A school library has 86 shelves and each shelf has 162 books. Find the number of books in the library.

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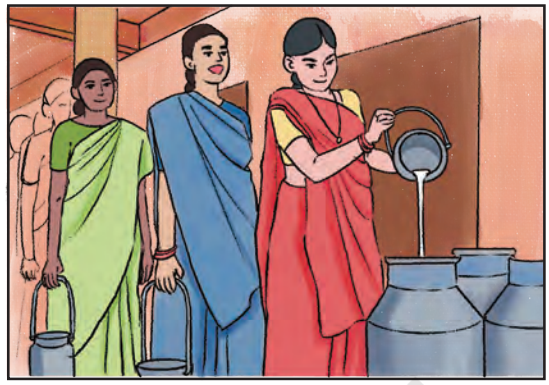
Dairy Cooperative

1. A dairy cooperative in a small town gets its milk from 268 villagers. Each villager has at least 4 milk-giving cows. What is the minimum number of cows the dairy cooperative gets its milk from?

   1 villager has at least 4 milk-giving cows. 268 villagers will have at least 268 × 4 cows.



$$\begin{array}{r} 268\ (200 + 60 + 8) \\ \times\ \ 4 \\ \hline 800 + 240 + 32 = 1{,}072 \end{array}$$

200 is added to 4×200 = 800

30 is added to 4 × 60 = 240

Remember!

4 × 6 Tens = 24 Tens = 240

4 × 2 Hundreds = 8 Hundreds = 800

Mili says her father has taught her to use place values of digits to multiply large numbers.

30 from 32 is added to 4×60, not to 60

200 from 270 is added to 4×200, not to 200

Th	H	T	O
	2	3	
	2	6	8
×			4
1	0	2	7	3	2

Discuss how this multiplication is being carried out!

The dairy cooperative gets milk from a minimum of 1,072 cows.

Many women dairy entreprenuers are playing significant role in the dairy sector. Jamanaben Maganbhai Naku of village Tuked in Surat possesses 27 Gir cows and rears the cows through Low-cost Farm Investment.

Note for Teachers: The algorithm for multiplication is challenging for learners to understand. While learners should surely be able to multiply large numbers using the ways they have learnt till now, this last step (Mili's father's method) need not be over-emphasised. Please support them if your students are ready for this. Otherwise, it is perfectly fine if learners can carry out multiplication of large numbers using John's methods.

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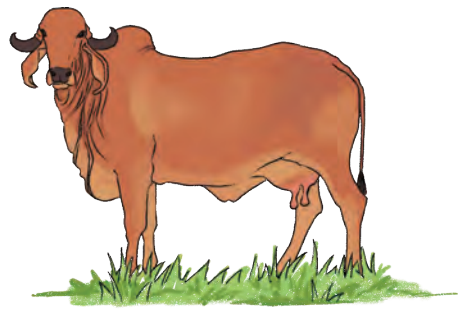
2. The villagers rear various breeds of cows. Gir is an Indian cow breed from Gujarat, with a high milk-producing capacity. Among the villagers, there are 453 Gir cows. Each of these cows give 13 litres of milk each day. How many litres of milk does the dairy cooperative receive from Gir cows everyday?



One Gir cow produces 13 litres of milk. 453 Gir cows will produce, 453 × 13 litres of milk.

100 is added to 3 × 400 = 1200

453 (400 + 50 + 3)
× 13 (10 + 3)

1200 + 150 + 9 = 1359 (3 × 453)
4000 + 500 + 30 = 4530 (10 × 453)
= 5889

3 × 5 T = 15 T = 150
3 × 4 H = 12 H = 1,200

Mili's father's method

	Th	H	T	O
		1		
		4	5	3
×			1	3
	1	3	1	9
+	4	5	3	0
	5	8	8	9

The 100 from 150 is added to 3×400 = 1200, not to 400

1 Ten × 453 = 453 Tens = 4530

The dairy cooperative receives 5,889 litres of milk from Gir cows every day.

Note for Teachers: The learners' attention needs to be drawn continuously to the place values of numbers and their products. Draw similarities with the steps between the different methods. Remind them to put appropriate zeros when multiplying by 10s and 100s.

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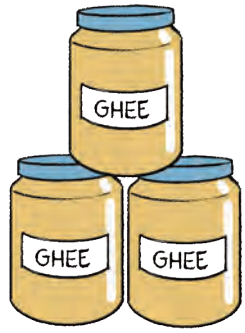
3. The dairy cooperative sells 1 kg cow ghee for ₹574. The cooperative is able to produce around 125 kg of ghee in a month. How much do they earn by selling ghee in a month?



Discuss what the same coloured digits might mean.

574 (500 + 70 + 4)
× 125 (100 + 20 + 5)

2,500 + 350 + 20	**= 2,870 (5 × 574)**
10,000 + 1,400 + 80	**= 11,480 (20 × 574)**
50,000 + 7,000 + 400	**= 57,400 (100 × 574)**
	= 71,750

	T Th	Th	H	T	O
			1		
			3	2	
			5	7	4
×			1	2	5
		2	2	8	3	7	2	0
	1	1	1	1	4	8	0
+	5	7	4	0	0		
	7	1	7	5	0		

2 Tens × 574 = 2 × 3,740

1 Hundred × 574 = 574 Hundreds = 57,400

The cooperative earns ₹ 71,750 from the sale of cow ghee.

Let Us Solve

1. Solve the following problems like Nida.

a) 548 × 6 b) 682 × 3 c) 324 × 18 d) 507 × 23 e) 190 × 65

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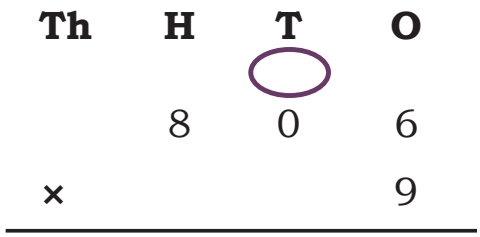
2. Solve the following problems like John.

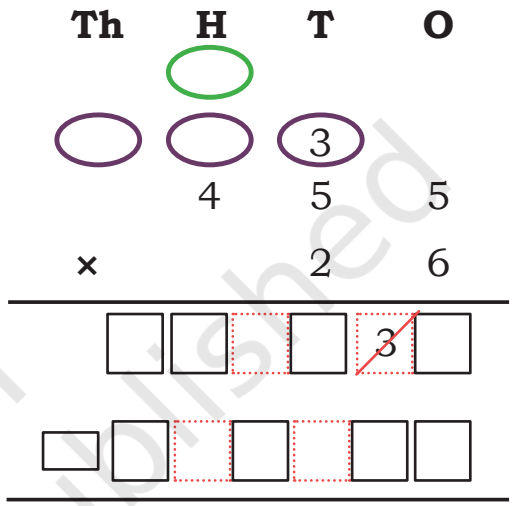
a) 123 × 84 b) 368 × 32

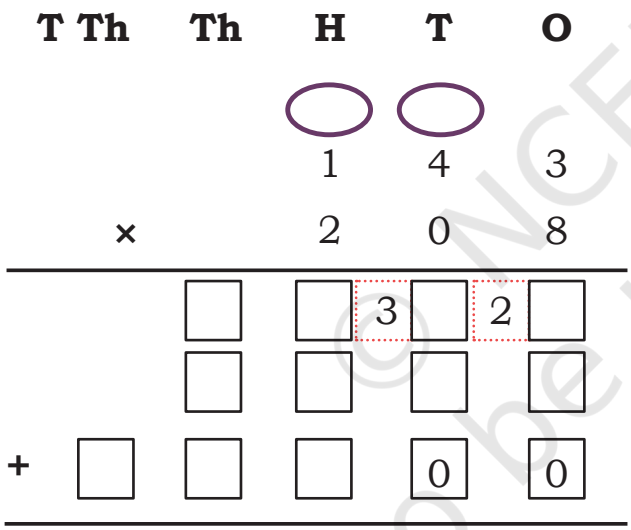
c) 159 × 324 d) 239 × 401

e) 592 × 5 f) 101 × 22

3. Let us solve a few questions like Mili's father.







Now use Mili's father's method to solve the following questions.

(a) 807 × 5 (d) 450 × 38 (g) 604 × 54

(b) 143 × 28 (e) 584 × 23 (h) 112 × 23

(c) 309 × 9 (f) 302 × 13 (i) 237 × 19

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Check, Check!

Check if the following children's solutions are correct. If correct, explain why the solution is correct. If it is incorrect, then identify the error and correct the solution.

a) Asma's solution

for 46 × 59

```
    46
 ×  59
 ------
 2,000
   300
   360
    54
 ------
 2,714
```

b) Pankaj's solution

for 203 × 54

```
      203
 ×     54
 ---------
  80 + 12 =   92
 100 + 15 = 115
 ---------------
          = 135
```

c) Lado's solution

for 38 × 150

```
        38
 ×     150
 ----------
 1,500 + 400   = 1,900
 3,000 + 800   = 3,800
 ---------------------
             = 5,700
```

d) Kira's solution

for 193 × 272

```
                 193
             ×   272
 ---------------------
 200 +   180 +    6 =    386
 700 +   630 +   21 =  1,351
20,000 + 18,000 + 600 = 38,600
 ---------------------------
                     = 40,337
```

e) Asher's solution

	T Th	Th	H	T	O
		(1)	(1)	(1)	
			6	2	6
×			3	2	3
		1	8	7	~~1~~ 8
		1	2	5	~~1~~ 2
+		1	8	7	~~1~~ 8
		5	0	1	8

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Let Us Do

1. Identify the problems that have the same answer as the one given at the top of each box. Do not calculate.

12 × 17	
11 × 18	6 × 34

26 × 11	
26 × 10 and 26 × 1	20 × 11 and 6 × 11

18 × 4	
9 × 8	20 × 4 – 8

55 × 9		
50 × 9 and 5 × 9	54 × 10	55 × 10 – 55

101 × 42	
100 × 42 and 100	100 × 42 and 42

247 × 8	
250 × 8 – 24	247 × 10 – 247

1001 × 5	
1,000 × 6	1,000 × 5 and 5

1999 × 2	
2,000 × 2 – 4	2,000 × 2 – 2

2. Find easy ways of solving these problems.

(a) 16 × 25 (b) 12 × 125 (c) 24 × 250
(d) 36 × 25 (e) 28 × 75 (f) 300 × 15
(g) 50 × 78 (h) 199 × 63 (i) 128 × 35

3. Write 5 other examples for which you can find easy ways of getting products.

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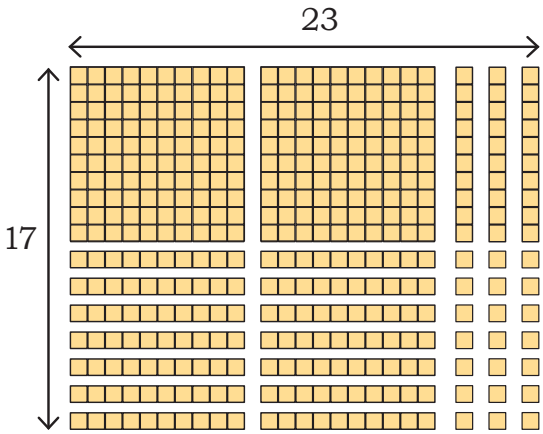
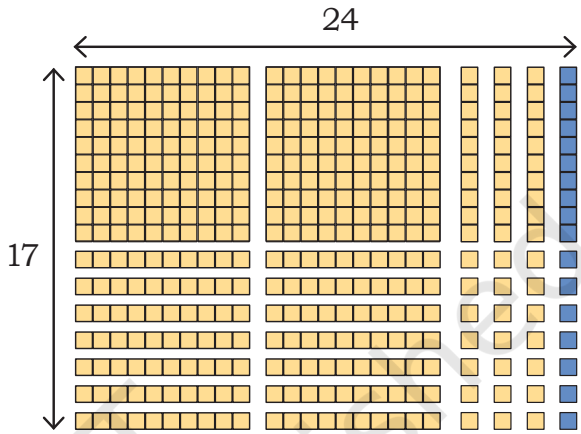
4. Find the answers to the following questions based on the given information.

(a) 17 × 23 = 391 (b) 17 × 24 = _____ (c) 17 × 22 = _____

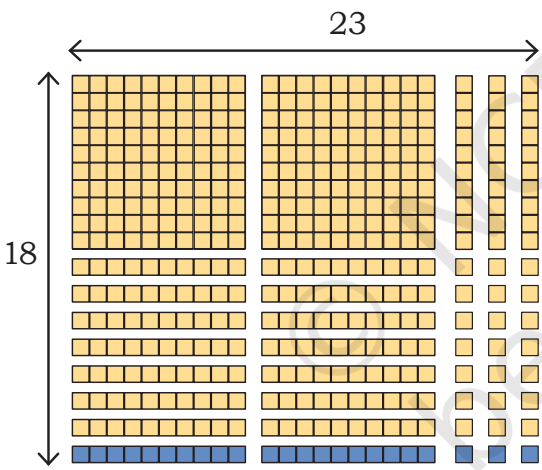
(d) 16 × 23 = _____ (e) 8 × 9 = 72 (f) 18 × 9 = _____

(g) 28 × 9 = _____ (h) 108 × 9 = _____ (i) 18 × 23 = _____





To find 17 × 24, how much is to be added to 17 × 23—17 or 23?



To find 18 × 23, how much is to be added to 17 × 23—17 or 23?

Let Us Think

1. Find the possible values of the coloured boxes in each of the following problems. The same colour indicates the same number in a problem. Some problems can have more than one answer.

a) ☐☐ × 3 = ☐☐

b) ☐☐☐ × 3 = ☐☐☐

c) ☐☐☐☐ × 3 = ☐☐☐☐

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d) $\square\square \times 5 = 1\square 0$

e) $\square\square\square \times 5 = \square\square 0$

f) $\square\square\square\square \times 5 = 1\square\square\square 0$

g) $\square\square\square \times 9 = \square\square\square\square$

h) $\square\square\square \times \square = 5,999$

i) $\square\square\square \times \square = 2,000$

2. Estimate the products on the left and match them to the numbers given on the right.

25 × 31	2,600
132 × 19	12,500
101 × 11	300
248 × 49	750
12 × 25	1,000

Discuss how you estimated.

The King's Reward

One day, a king decided to reward three of his most talented ministers. The king called them to his court and said, "You all have served my empire with great dedication. As a reward, I give you three choices of gold.

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Choose wisely!

Choice 1: Take 5 gold coins and double the number of coins every day for 7 days.

Choice 2: Take 3 gold coins and triple the number of coins every day for 7 days.

Choice 3: Take 1 gold coin and multiply the number of coins by 5 every day for 7 days.

Minister 1—I will take 5 gold coins and double the number of coins every day for 7 days.

Minister 2—I will take 3 gold coins and triple the number of coins every day for 7 days.

Minister 3—I will take 1 gold coin and multiply the number of coins by 5 every day for 7 days.

The King gave 5 coins to Minister 1, 3 coins to Minister 2 and 1 coin to Minister 3.

Which of the rewards would you have chosen?

After a week, the 3 ministers were surprised at the final amount of gold coins. Guess who received the most gold coins? Calculate how much gold coins each minister received.

Multiplication Patterns

1. Notice how the multiplier, multiplicand, and products are changing in each of the following. What is the relationship of the new product with the original product? Solve a) completely, and then predict the answers for the rest.

a) 16 × 44 = 704

1) 8 × 88 = 704
2) 8 × 22 = 176
3) 16 × 22 = _____
4) 32 × 44 = _____

b) 12 × 32 = 384

1) 6 × 16 = _____
2) 24 × 16 = _____
3) 24 × 64 = _____
4) 12 × 16 = _____

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2. Observe and complete the given patterns

$1 \times 1 = 1$
$11 \times 11 = 121$
$111 \times 111 = 12{,}321$
$1111 \times 1111 =$ _____

$5 \times 5 = 25$
$15 \times 15 = 225$
$25 \times 25 = 625$
$35 \times 35 = 1{,}225$
$45 \times 45 =$ _____
$55 \times 55 =$ _____

5 × 5 = 25
2 × 1 = 2
5 × 5 = 25
3 × 2 = 6

$11 \times 12 = 132$
$11 \times 34 = 374$
$11 \times 56 = 616$
$11 \times 78 = 858$
$11 \times 54 =$ _____
$11 \times 82 =$ _____

H T O
1×1 1+2 1×2
H T O
1×3 3+4 1×4

$1 \times 9 + 1 = 10$
$12 \times 9 + 2 = 110$
$123 \times 9 + 3 = 1{,}110$
$1{,}234 \times 9 + 4 =$ _____

Here are some numbers. Remember **number pairs** from Grade 4? Any two adjacent numbers in a row or a column are number pairs. Can you identify the pair whose product is the smallest and another pair whose product is the largest? Do you need to find every product or can you find this by looking at the numbers?

8	35	75
32	62	13
66	11	14

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Let Us Solve

1. Mala went to a book exhibition and bought 18 books. The shop was selling 3 books for ₹150. After buying the books, she still had ₹20 left. How much money did Mala have at the beginning?
2. A village sports club organises a women's football tournament. The club earned money by selling match tickets and charging fees for team participation.

   They sold 57 tickets for ₹115 each.

   They had 3 teams joining the tournament, with each team paying a participation fee of ₹1,599.

   The teams paid ₹1,750 in total to rent the football ground and ₹1,129 for food and water.

   (a) How much money did the club collect in total from ticket sales and team participation fees?

   (b) What were the total expenses on renting the ground and food and water?
3. Ananya is watching Republic Day celebrations on the city's public ground. There are 12 rows of students sitting in front of her and 17 rows behind her. There are 18 students to her right and 22 students to her left.

   (a) How many rows of students are there in total?

   (b) How many students are there in Ananya's row?

   (c) What is the total number of students on the ground?
4. Multiply.

   (a) 67 × 78 (b) 34 × 56 (c) 45 × 263

   (d) 86 × 542 (e) 432 × 107 (f) 310 × 120
5. If 67 × 67 = 4489, without multiplication find 67 × 68.
6. If 99 × 100 = 9900, without multiplication find 99 × 99.

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Chapter 7

Shapes and Patterns

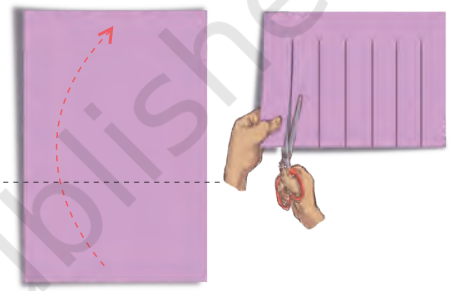
Weaving Mats

You may have seen woven baskets of different kinds. If you look closely, you will notice different weaving patterns on each basket.

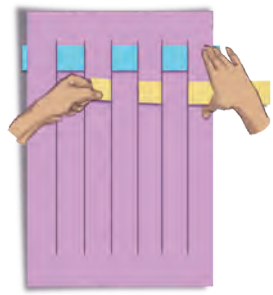
We will try weaving some mats with paper strips.

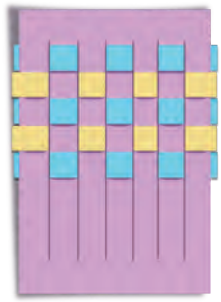
1. Let us make paper mats.

You will need—A coloured paper (30 cm long and 20 cm wide) and eight paper strips of two different colours (3 cm wide and longer than 20 cm).



(a) Take a coloured paper 30 cm long and 20 cm wide.
(b) Fold the coloured paper in half along the longer side.
(c) Draw vertical lines at equal distances from the closed end and cut slits leaving a gap of 3 cm at the top.
(d) Carefully unfold the paper. There will be no cuts in the paper at the top and the bottom.
(e) Now cut 8 paper strips of 3 cm width in 2 colours and of length slightly longer than 20 cm.
(f) Take one colour strip and weave it across the slits going 1 under and 1 over, and again 1 under and 1 over. Repeat it for the first row.
(g) Take one more strip of another colour and weave it across the slits going 1 over and 1 under, and again 1 over and 1 under. Repeat it for the second row.
(h) Weave all the strips in the same alternating pattern. Neatly fold any extra strip ends behind the mat. Your mat is ready!





We can describe the pattern of the above weave as follows.
Row 1—1 under, 1 over, 1 under, 1 over, ... (repeat)
Row 2—1 over, 1 under, 1 over, 1 under, ... (repeat)

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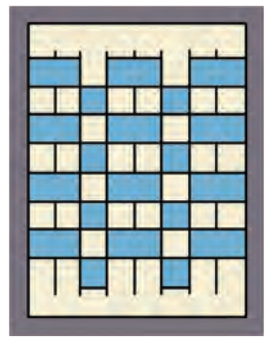
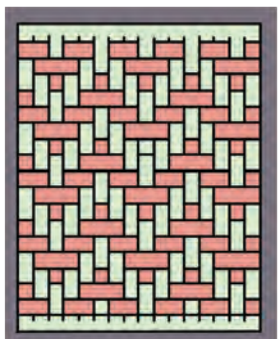
2. Can you figure out how to make this mat?



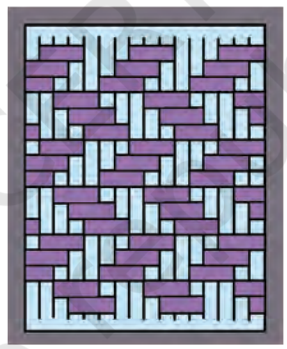
Let us try to understand how this mat is woven by looking at the pattern in the first two rows.
Row 1—2 over, 1 under, 2 over, 1 under, ...
Row 2—2 under, 1 over, 2 under, 1 over, ...
You can use strips of the same colour or 2 different colours, one for each row.

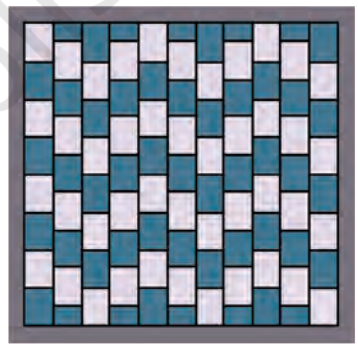
3. Try to weave a pattern, using the rules given below.



Row 1—2 over, 1 under, 2 over, 1 under, ... (repeat).
Row 2—1 under (do not repeat), 3 over, 3 under, 3 over, 3 under, ... (repeat).
Row 3—2 under, 1 over, 2 under, ... (repeat).
Row 4—1 over (do not repeat), 3 under, 3 over ... (repeat).
Continue weaving in this order.

4. Can you work out the steps for any of these designs and weave the pattern?

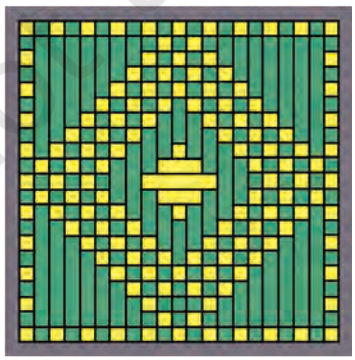


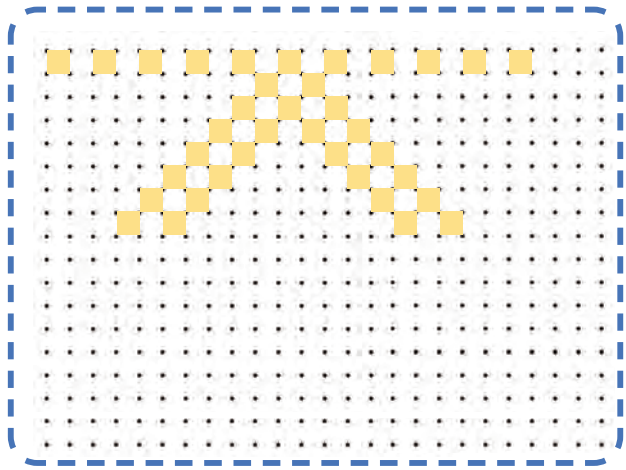


Write the steps of the pattern in your notebook for each row until it starts repeating.

Let Us Try

Draw the following pattern on a grid paper. Part of it is done for you. Now, complete the rest of the grid to get the full design.





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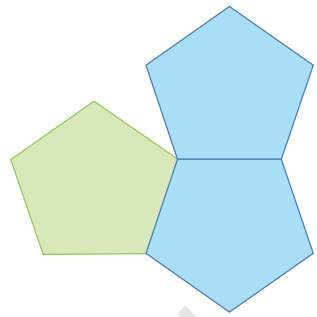
Tiling and Tessellation

We often use tiles of the same shape or a combination of shapes to cover a region.



You can see pentagons (5-sided figures) in this figure.

As all its sides are equal it is a **regular pentagon.**

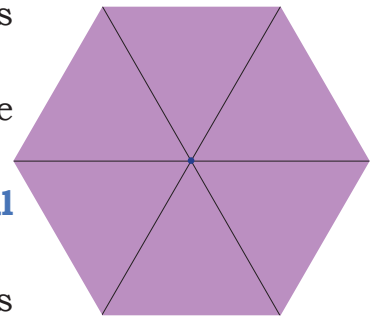
Shapes that have equal sides are called **regular shapes.**

We have placed 3 pentagons around a point. Can we fit one more into the empty space?

Pentagons cannot fill a region without leaving gaps. So, we say that regular pentagons do not tessellate.

Find Out

Can regular triangles fit together at a point without any gap? How many of them fit together? (A sample triangle is given at the end of the book). Do you see that regular triangles fit around a point as shown here?



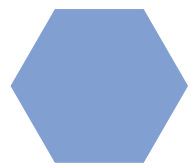
Regular triangles when fitted around a point leave no gaps and there is no overlap.

Triangles with all equal sides are also called **equilateral triangles**.

Therefore, equilateral triangles tessellate. Can squares (a regular 4-sided shape) fit together around a point without any gap or overlap? Try it out using cutouts of squares (a sample square is given at the end of the book). How many squares did you need?

Can five squares fit together around a point without any gaps or overlaps? Why or why not?

Can **regular hexagons** (6-sided shapes with equal sides) fit together around a point without any gaps or overlaps? Try and see (a sample hexagon is given at the end of the book). How many fit together at a point?



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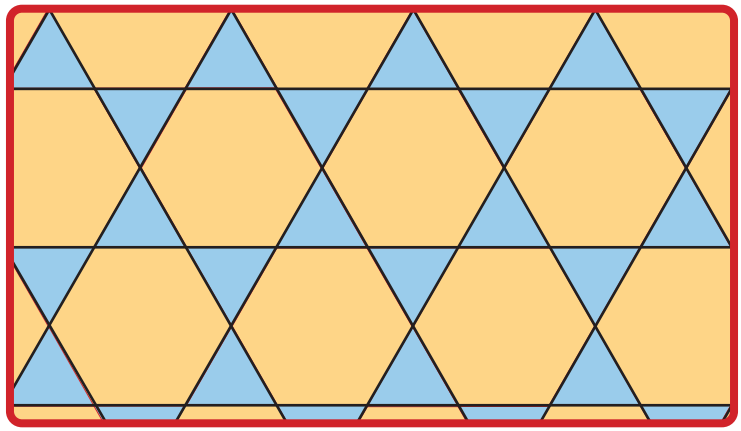
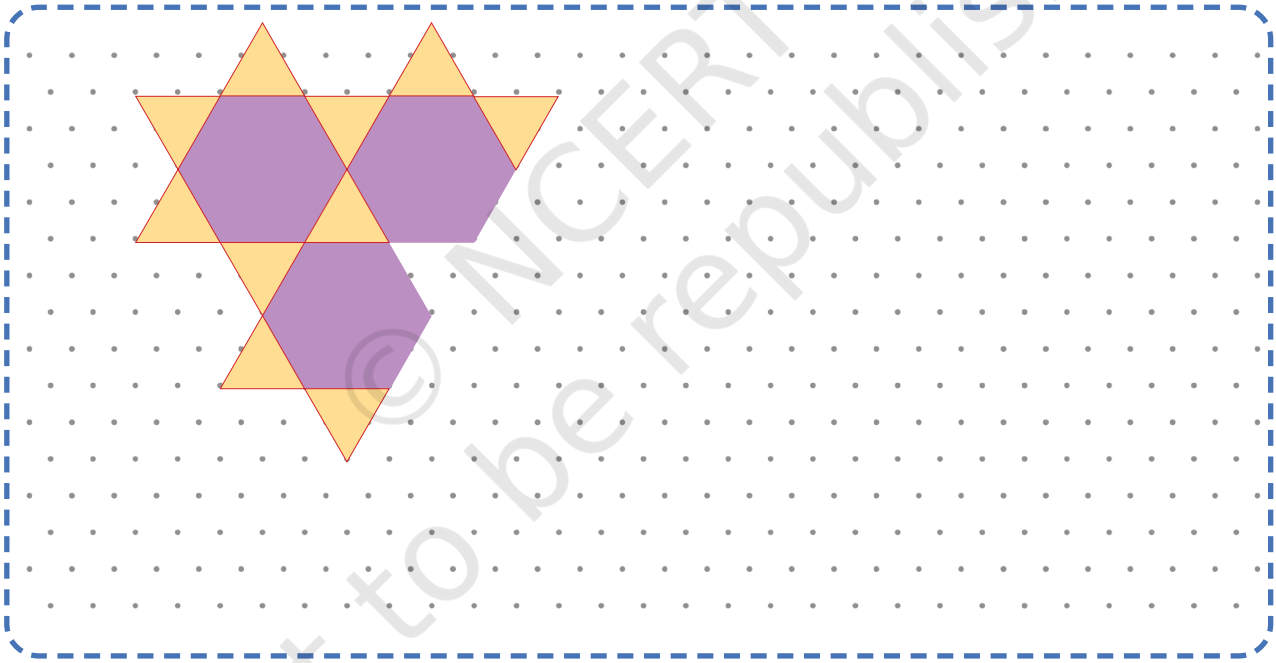
Here is a tessellating pattern with more than one shape.

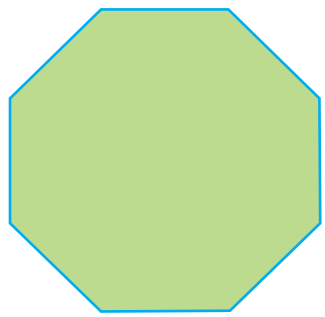
What shapes have been used in this pattern? _____, _____.



Continue the pattern given below and colour it appropriately.



A **regular octagon** means a shape with eight equal sides.



Do regular octagons fit together without any gaps or overlaps? Try drawing the same and check.

Regular octagons do not tessellate.

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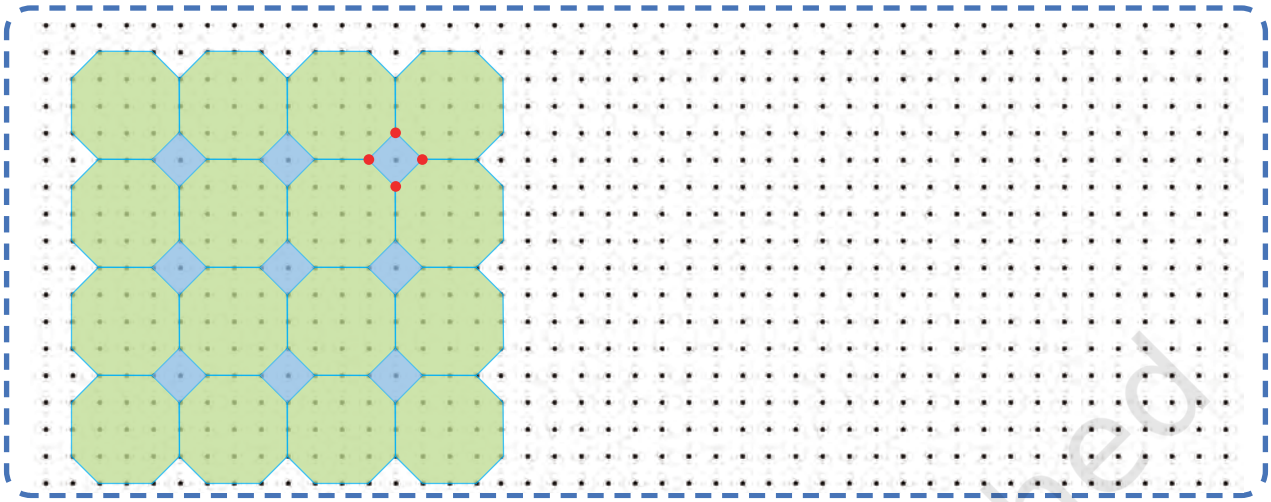
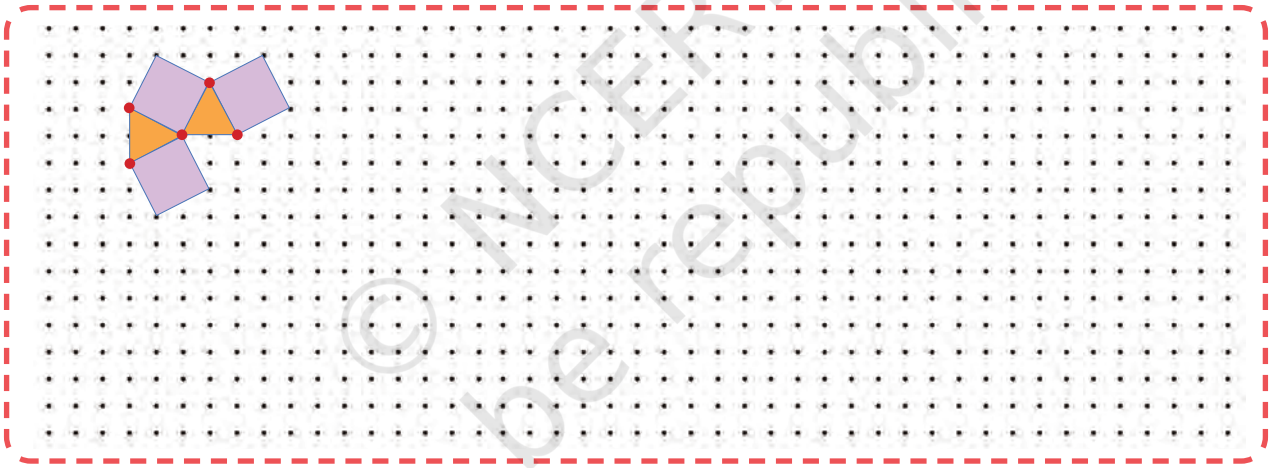
Look at the pattern given below. What shapes are coming together at the marked points? Are the same set of shapes coming together at these points? Continue the pattern and colour it appropriately.



Here is a tiling pattern made using two different shapes—squares and triangles. Are the triangles equilateral? Why or why not?

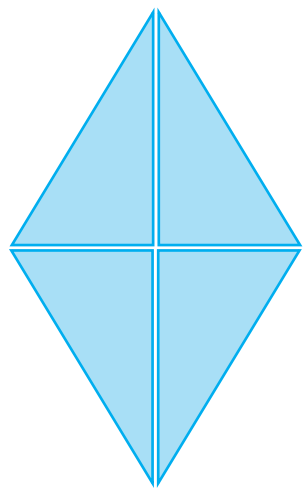


What shapes are coming together at the marked points?

Are the same set of shapes coming together at these points? Continue the pattern and colour it appropriately.

Create similar patterns using other cutouts of shapes.

A **rhombus** is a shape with all equal sides. It has been divided into four triangles.



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You will find a copy of this rhombus at the end of the book. Cut out the triangular pieces for the following activities.

What geometrical shapes can you make by fitting 2 of these triangles together? Trace the shapes you created.

1. How many different types of triangles can you make?

   Now, observe and measure the sides of these triangles. What do you notice?

Each triangle has 2 equal sides. Such triangles are called **isosceles triangles**.

Trace the isosceles triangles on a paper and cut them out. Fold them in half. What do you notice about their angles?

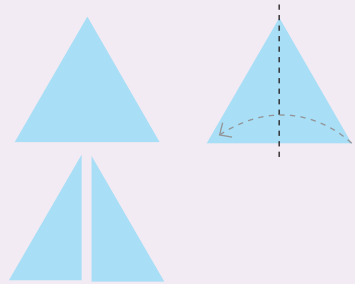
Each isosceles triangle has 2 equal angles.

2. Is it possible to make a triangle where all three sides are equal (equilateral triangle)?
3. Is it possible to make a triangle where all three sides are unequal?

Try This

Cut the equilateral triangle provided at the end of the book. Check if all the angles of an equilateral triangle are equal—just like you did with the isosceles triangle.

Equilateral triangles have equal angles.



Now, cut the equilateral triangle in half. How many sides of each new triangle are equal?
Triangles that have no equal sides are called **scalene triangles.**
Check in scalene triangles whether any two or more angles are equal?

Note for Teachers: Encourage the learners to use paper folding methods to compare the angles of a shape.

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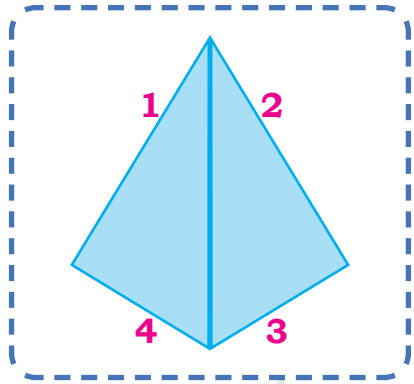
4. How many different 4-sided shapes (quadrilaterals) can you make?

Here are three possible shapes.



Have you made a shape like the one shown on the right?

This shape is called a **kite**.

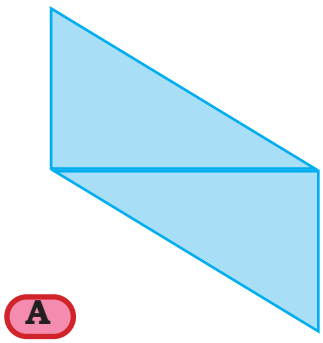
What do you notice about the sides of a kite?

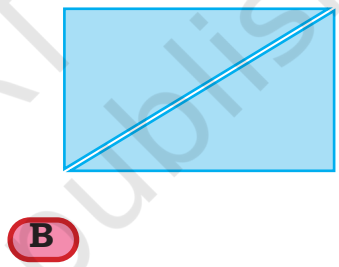
Side 1 = Side 2.

Similarly, Side 3 = Side 4.

These sides are called **adjacent sides**.

Here are two other possible quadrilaterals that are not kites.





5. Measure the sides of each of these two quadrilaterals A and B. What do you notice?

   Are there any pairs of sides that are equal? Which pairs are equal—adjacent or opposite?

Quadrilaterals whose opposite sides are equal are called **parallelograms**.

What types of angles do quadrilaterals A and B have? Which angles are equal in each of the above parallelograms?

In parallelogram A, opposite angles are equal.

In parallelogram B, all angles are equal and are right angles. Such a parallelogram is called a **rectangle**.

A rectangle is a special type of parallelogram.

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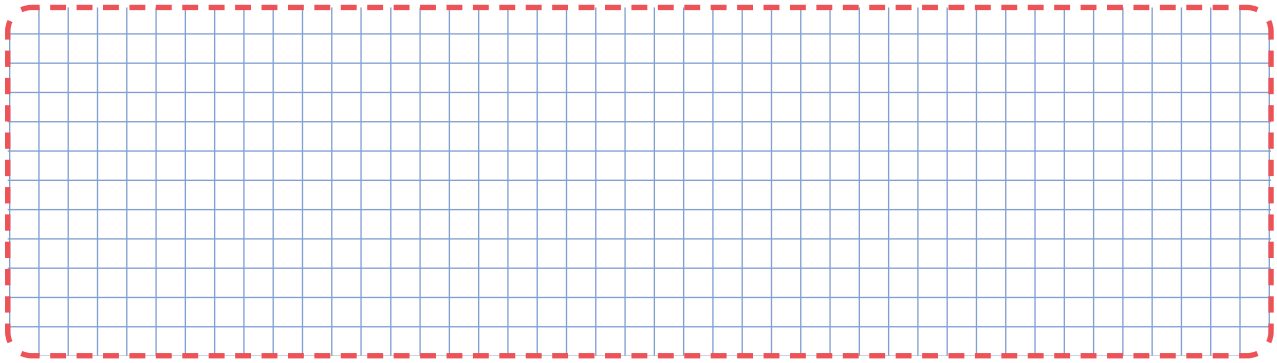
6. In the grid given below, draw two different kites and parallelograms each.

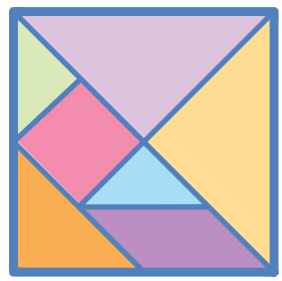


7. Now, use 3 triangles from the rhombus to form shapes. How many sides do each one of them have?

Using 3 triangular pieces of the rhombus, try creating a (a) 3-sided shape, (b) 4-sided shape, and (c) 5-sided shape.

8. Which of these shapes can be made with all 4 pieces? Try and find out.
   (a) Square
   (b) Rectangle
   (c) Triangle
   (d) Pentagon (5-sided)
   (e) Hexagon (6-sided)
   (f) Octagon (8-sided)

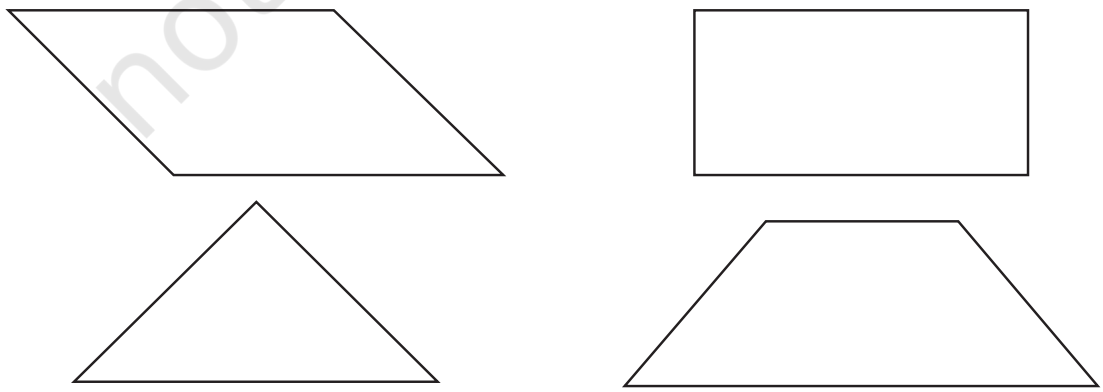
Tangram



Look at the tangram set given at the end of your textbook. Cut out all the shapes. Name them.

(a) How are they same or different from each other?
(b) What do you notice about the angles of each of the shapes?
(c) What do you notice about the sides of each of the shapes?

Now, use some or all of the pieces of your tangram set to make the following shapes. There may be more than one way to do it.



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Which Shape Am I?

Match the statements with appropriate shapes. Do some of them describe more than one shape?

	Statement	Shape
1.	All my angles are right angles, but all my sides are not equal.	(Square) (Rectangle) (Rhombus) (Parallelogram)
2.	All my sides are equal, but all my angles are not.	
3.	My opposite angles are equal, but my sides do not make a right angle.	
4.	Two pairs of sides are equal, but they do not make a right angle.	
5.	All my sides make right angles with each other and are equal.	
6.	My opposite angles are equal and so are my sides.	
7.	My opposite angles are equal and my sides make right angles.	

Kites

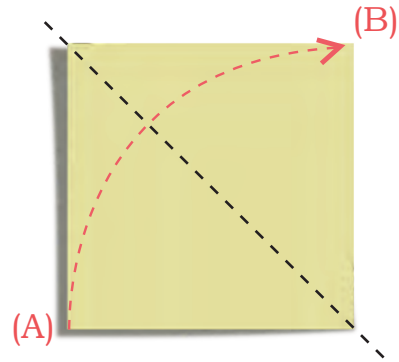
Make your own kite shape.

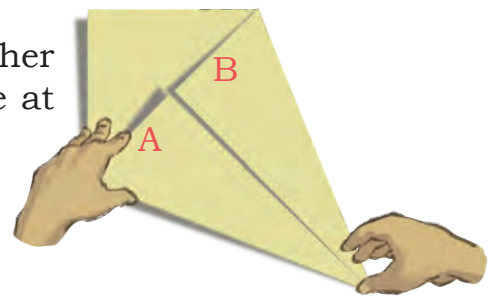
(a) Start with a square piece of paper.

(b) Take one corner of the paper and fold it towards the opposite corner, creating a sharp crease along the diagonal.

(c) Open and fold the corner A inwards, aligning the edge with the crease you just made.

(d) Repeat on the other side, folding the other corner B inwards to align with the crease at the centre.





You have a kite shape!

What shapes do you see in the kite?

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Play with Circles

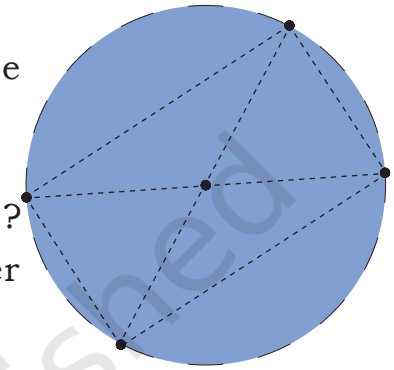
Do you remember a circle?

(a) Draw a circle with a compass and mark its centre.

(b) Draw its diameter. Mark the endpoints of the diameter.

(c) Draw another diameter of the circle and mark the endpoints.

(d) Now join the four points.



What shape is formed? Check the sides of the quadrilateral and the angles obtained.

Try with a different pair of diameters.

What do you notice about the shape that is formed?

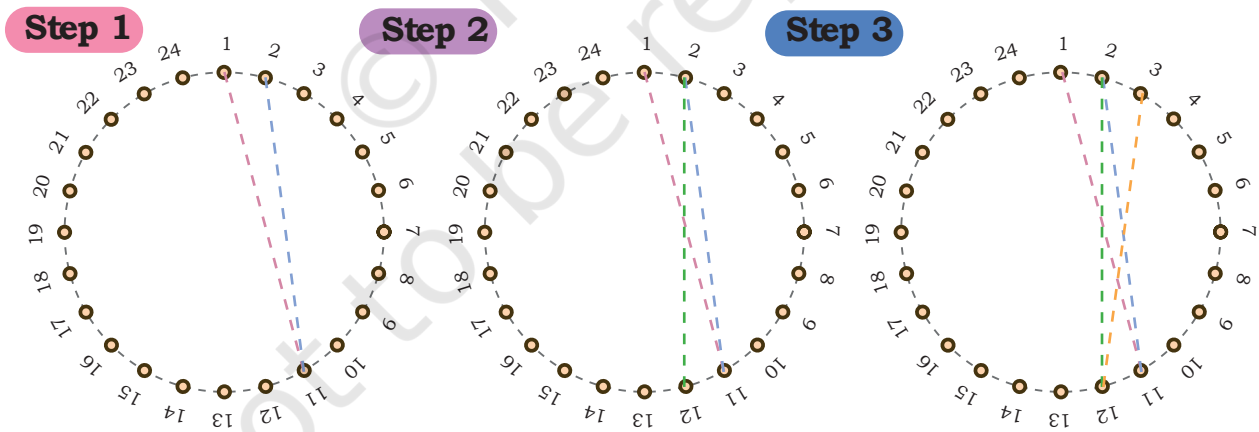
Is it possible to create a 4-sided shape other than a rectangle through this process?

Circle Designs

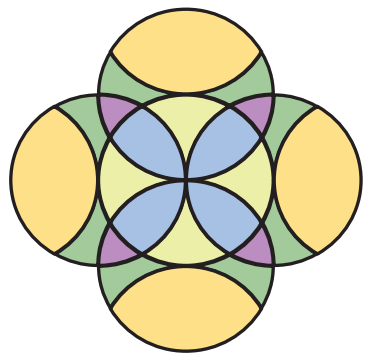
Look at the circle given below. It is marked with points 1 to 24.

Join points 1 to 11, 11 to 2, 2 to 12, and so on till you reach back at 1.

(Try it with different coloured threads on a thick paper or cloth.)



Can you think of a way to make a design exactly like the image given here? Try to make it.



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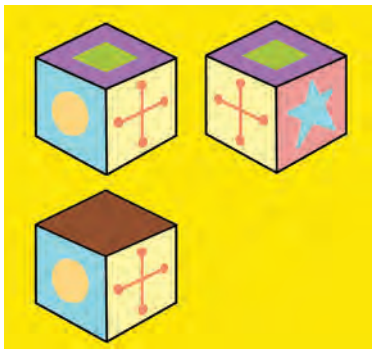
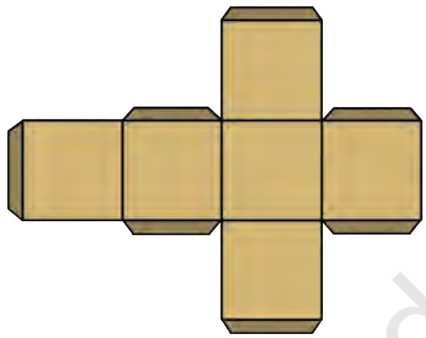
Cube Connections

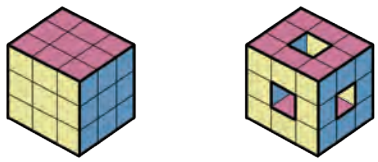
1. Here are three views of a cube. Can you draw them on the net in the correct order?



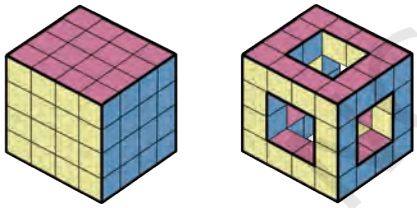


2. Here are some big solid cube frames. How many small cubes have been removed from each cube?

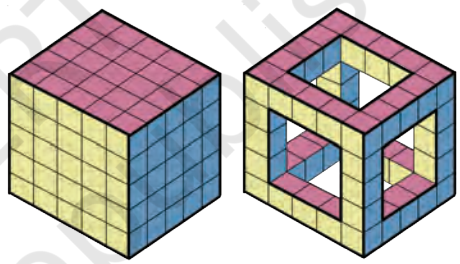
(a)



(b)



(c)



3. Nisha has glued 27 small cubes together to make a large solid cube. She paints the large cube red. How many of the original small cubes have—

(a) three faces painted red? _____ (b) two faces painted red? _____

(c) one face painted red? _____ (d) no faces painted red? _____

Puzzle

Tanu arranged 7 shapes in a line. She used 2 squares, 2 triangles, 1 circle, 1 hexagon, and 1 rectangle.

Find her arrangement using the following clues:

(a) The square is between the circle and the rectangle.
(b) The rectangle is between the square and the triangle.
(c) The two triangles are next to the square.
(d) The hexagon is to the right of the triangle.
(e) The circle is to the left of the square.

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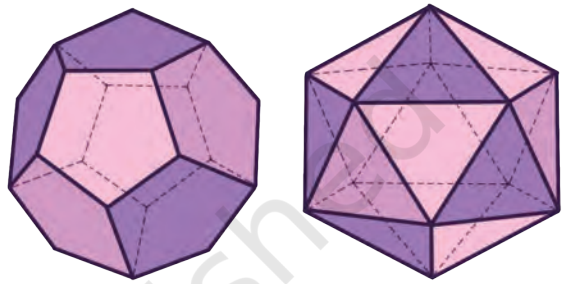
Icosahedron and Dodecahedron

What do these names mean? Once you count their faces, you will know.

Use the nets provided at the end of the book to make icosahedron and dodecahedron models.

What shapes do you see in an icosahedron and a dodecahedron?

Icosahedron: ..... Dodecahedron: .....



Do all the faces look the same?

Icosahedron: ..... Dodecahedron: .....

How many faces meet at a vertex (point)?

Icosahedron: ..... Dodecahedron: .....

Do the same number of faces meet at each vertex?

Icosahedron: ..... Dodecahedron: .....

How many edges do you see?

Icosahedron: ..... Dodecahedron: .....

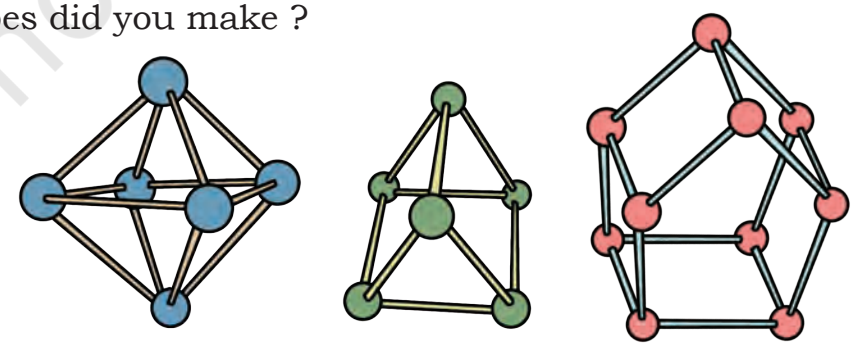
How did you count them such that you do not miss out any edge or count an edge twice?

Can you think of any other solid shapes that have faces that look the same?

Do the same number of faces meet at each common vertex? .....

You can also build some 3-D shapes using straws or ice-cream sticks and clay or play dough.

Which shapes did you make ?



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Chapter 8

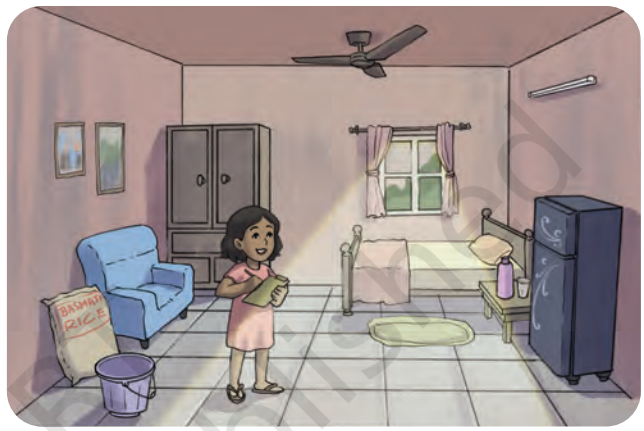
Weight and Capacity

0533CH08

Check! Check!

Anu has recorded the weights of the items in her house. Check if she has recorded them correctly by putting a tick against them if they look correct.

1. Iron Almirah – 40 g
2. Bed – 60 kg
3. Rice Bag – 5 kg
4. Sofa – 30 g
5. Bucket – 1 kg 800 g
6. Water Bottle – 650 g
7. Refrigerator – 50 g

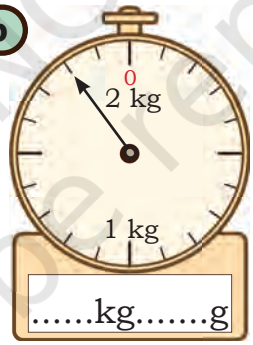


Let Us Do

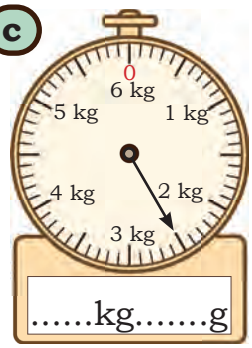
Read the scales. Write the correct weight in the space given below.

a

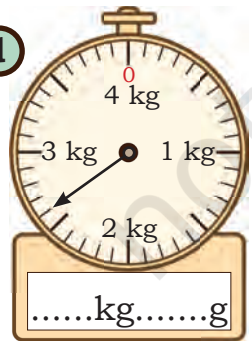
b



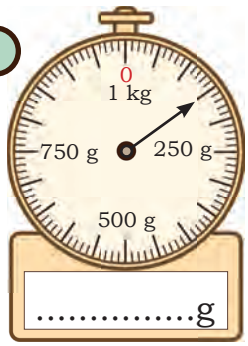
c



d



e



f

Note for Teachers: The learners should be capable of reading various types of weighing scales in different settings for measuring weights of different objects. Help learners to make sense of each of the scales and make them understand how the '0' works in each scale.

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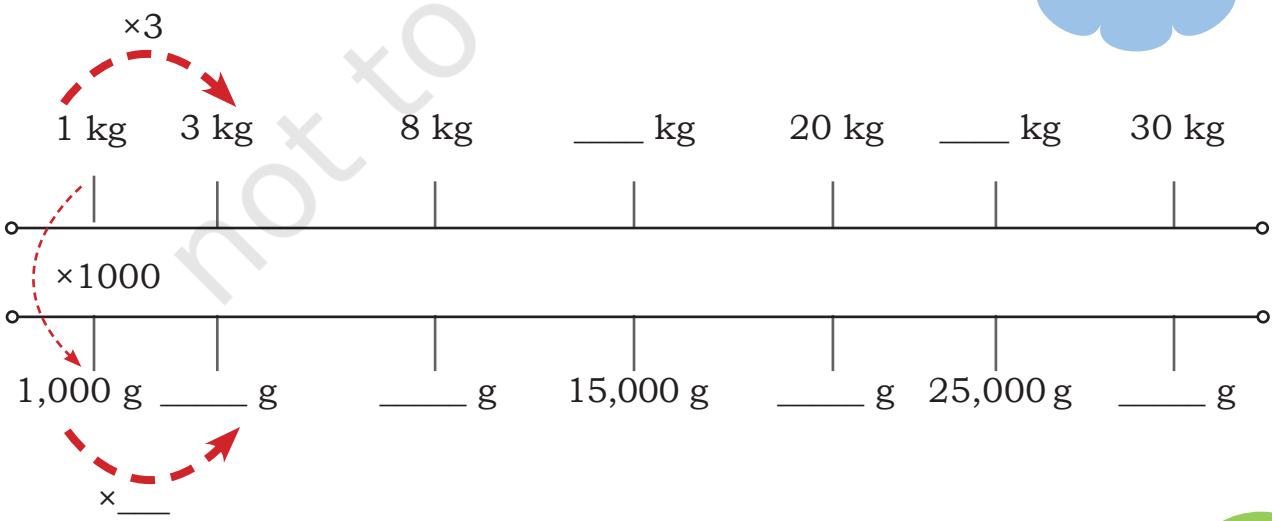
Different Units but Same Measure

Bags are weighed on two different weighing balances. One weighing balance displays weight in kilograms and other displays weight in grams.

Match the bags that have the same weights. You can use the double number line given below.

Weighing Balance 1	*Weighing Balance 2*
5 kg	3,000 g
10 kg	6,000 g
3 kg	10,000 g
6 kg	30,000 g
25 kg	5,000 g
30 kg	25,000 g

Notice the relationship between kg and g.



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Let Us Find

Shrenu is baking cakes for her shop. She needs 3 kg 500 g flour. Her kitchen scale measures only in grams. What should her kitchen scale show for 3 kg 500 g of flour?

3 kg = 3,000 g
3 kg 500 g = 3,500 g

What would be 2 kg 250 g flour in grams?

2 kg = 2,000 g
2 kg 250 g = 2,250 g

Let Us Find

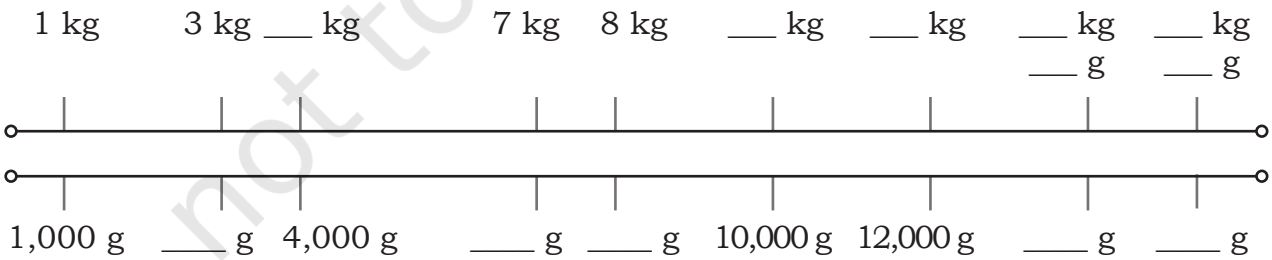
1. Shamim and Rehan observed someone buying sugar weighing 5 kg 50 g. They thought of the quantity in grams. How much is it?

5,050 g

No, it is 5,500 g

Who do you think is right and why?

2. Complete the conversions by filling in the blanks. You can use the double number line given below on which some numbers have been marked.



(a) 7 kg 67 g = _____ g

(b) 3 kg 300 g = _____ g

(c) 8 kg 69 g = _____ g

(d) 10,760 g = _____ kg _____ g

(e) 4,080 g = _____ kg _____ g

(f) 12,042 g = _____ kg _____ g

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Comparison between Different Weights

1. Harpreet's family planned a picnic over the weekend. Her mother and father packed different food items to take along. The following is the list of fruits they carried.

Watermelon	– 3 kg
Pineapple	– 1 kg 750 g
Apples	– 1 kg 250 g
Mangoes	– 2 kg

Among the fruits they carried, which one has the

(a) highest weight? _____

(b) least weight? _____

(c) Arrange the items in descending order of their weight.

_____ _____ _____ _____

2. Compare the weights using <, =, > signs.

(a) 1 kg 600 g	_____	1,700 g
(b) 1 kg 600 g	_____	1 kg 60 g
(c) 10 kg 35 g	_____	10035 g
(d) 1 kg 600 g	_____	2 kg 500 g
(e) 5 kg 50 g	_____	4 kg 500 g
(f) 900 g + 7,000 g	_____	7 kg + 900 g

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Milligram

How much weight can an ant carry?

How much does an ant weigh?

Ants weigh between 1 milligram and 5 milligrams. They can carry a lot more weight than their own weight.

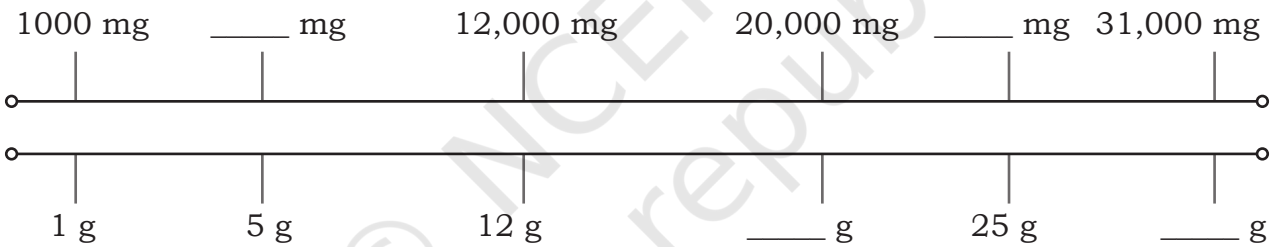
What is a milligram?

1 g = 1,000 milligram (mg)

Let Us Find

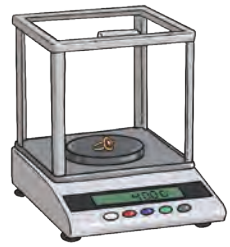
1. If a sugar sachet weighs 5g, how much will it be in milligrams?

2. Complete the double number line below appropriately.



3. An ornament weighs 4 g 100 mg. What will be the weight in milligrams?

Converting **g** to **mg** is similar to converting kg to g.
4 g = 4,000 mg
4 g 100 mg = 4,100 mg



4. A goldsmith has made an ornament weighing 10 g 500 mg. What will its weight be in milligrams? _____

Note for Teachers: Discuss objects that are light and measured in milligrams (mg), like ingredients in medicine, gold ornaments, etc. Encourage the learners to explore and find similar objects around them.

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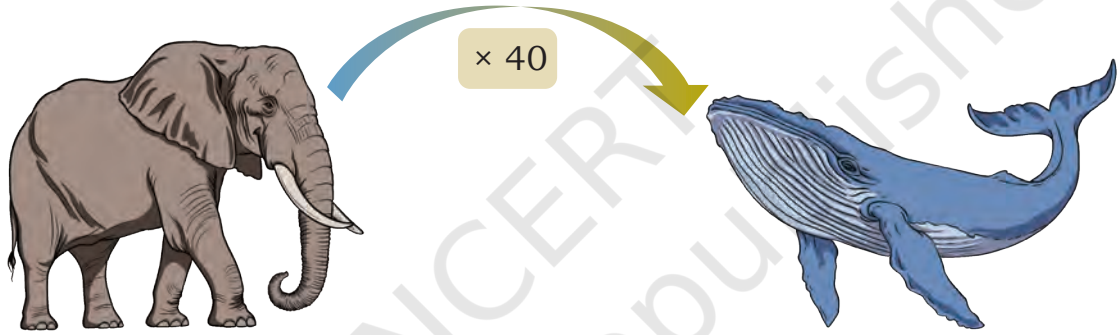
5. Compare the weights using <, =, > signs.

(a) 20 g	_____	200 mg
(b) 16 g 50 mg	_____	50 g 16 mg
(c) 2,010 mg	_____	2 g 100 mg
(d) 9,000 mg	_____	90 g
(e) 5,000 g	_____	7,500 g
(f) 800 mg + 88 mg	_____	880 mg + 8 mg

Did you know?

100 kg = 1 quintal
10 quintals = 1 tonne → 1,000 kg = 1 tonne

6. Observe the pictures given below and fill in the blanks.



5,000 kg

..... kg

7. Answer the following questions.

(a) 5,000 kg = _____ quintals = _____ tonne
(b) 9,000 kg = _____ quintals
(c) _____ kg = 8 tonnes

King's Weight

In a kingdom, the king donates wheat grains equal to 10 times his weight on his birthday.

(a) If he donates 800 kg of wheat grain this birthday, what is his current weight? _____ kg.

(b) If he had donated 780 kg of wheat grain on his last birthday, what was his weight last year? _____ kg.

(c) How much weight did he gain in a year until this birthday?_____ kg.

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From Tiny to Big

1,000 mg = 1 g
1,000 g = 1 kg
100 kg = 1 quintal
10 quintals = 1 tonne

The Grocery Store

Rathna went to the local grocery store and bought several items.

She bought 2 kg 500 g rice for daily use and 1 kg 750 g additional rice for the upcoming Pongal festival. How much total rice did she buy?

I can think like this
2 kg 500 g + 1 kg 750 g
= 3 kg + 500 g + 750 g.
500 g + 750 g
= 500 g + 500 g + 250 g
= 1 kg + 250 g
So, total rice bought is 4 kg 250.

	kg	g
	2	500
+	1	750
	4	1250

We can add and subtract like quantities.

1,000 g = 1 kg

We can also convert the quantities into grams.
2,500 g + 1,750 g

	Grams
	2500
+	1750
	4250

4250 g = 4 kg 250 g

How much extra rice did she buy for household use than for the Pongal festival?

Note for Teachers: Note that three different ways have been suggested above for adding and subtracting weights. The need for these different strategies arises depending on the numbers used. If the numbers are 250, 500, 750 or even 200, 400, 500, etc., we can add and subtract numbers orally. In fact, we should encourage these mental strategies to be able to use mathematics for daily life problem-solving. When numbers are not amenable to such oral calculations, the learners can choose one of the column strategies provided here, based on their comfort. Help learners observe the similarity between subtraction of numbers and subtraction of quantities like weights.

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I can also think like this.
We have to do
2 kg 500 g – 1 kg 750 g.
Take away 500 g from
2 kg 500g.
We get 2 kg.
Take away 1 kg from
2 kg. We get 1 kg.
Now, take away 250 g.
We get 750 g.

kg		g			kg		g		
(1)					(1)	(0)	(14)	(10)	
~~2~~	1	5	0	0	~~2~~	~~1~~	~~5~~	~~0~~	0
– 1		7	5	0	– 1		7	5	0
					0		7	5	0

Convert
1 kg = 1000 g

Grams

(1)	(14)	(10)	( )		
~~2~~	~~5~~	~~0~~	0		
– 1	7	5	0		
0	7	5	0	=	750 g

Convert the
quantities into grams.
We get 2500 g and 1750 g.
Now subtract as before.

Let Us Do

1. A restaurant owner uses 5 kg 200 g, 8 kg 900 g, and 12 kg 600 g of onions over 3 days. What is the total weight of onions used by the restaurant owner in 3 days?
2. Aarav is helping his grandfather at the fruit stall. He lifts two baskets of apples weighing 2 kg 100 g and 3 kg 950 g. What is the total weight of apples he lifted?
3. 4 kg 500 g of sand is used from a sack weighing 10 kg. How much sand is left in the sack?
4. A rice sack weighs 9 kg 750 g. After some rice is used, it weighs 3 kg 700 g. How much rice was used?
5. A delivery truck delivered 17 kg 900 g of supplies in the morning and 12 kg 700g in the afternoon. How much total supplies did it deliver?
6. A box of books weighs 14 kg 750 g. After removing some books, the weight of the box is 10 kg 500 g. What is the weight of the books removed?
7. In a community kitchen of a Gurdwara, 65 kg of flour was purchased on one day. Out of this, 42 kg 275 g flour was used for preparing langar. The next day, an additional 52 kg 500 g of flour was bought. What is the total quantity of flour now available in the kitchen store?

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More Operations on Weight

1. A farmer weighs a sack of potatoes and finds it to be 10 kg 500 g. If the farmer has 4 such potato sacks, what is the total weight of all the sacks?

   4 × 10 kg 500 g
   = 4 ×10 kg and 4 × 500 g
   = 40 kg + 2000 g
   = 40 kg + 2 kg = 42 kg.

You can find the product by multiplying the kg and g separately and adding the two. You can also convert the quantity into grams and then multiply.

2. A box of nuts weighing 4 kg 800 g is equally distributed into 4 smaller boxes. What is the weight of each small box in grams?

   4 kg ÷ 4 = 1 kg
   800 g ÷ 4 = 200 g
   So, 4 kg 800 g ÷ 4 = 1 kg 200 g

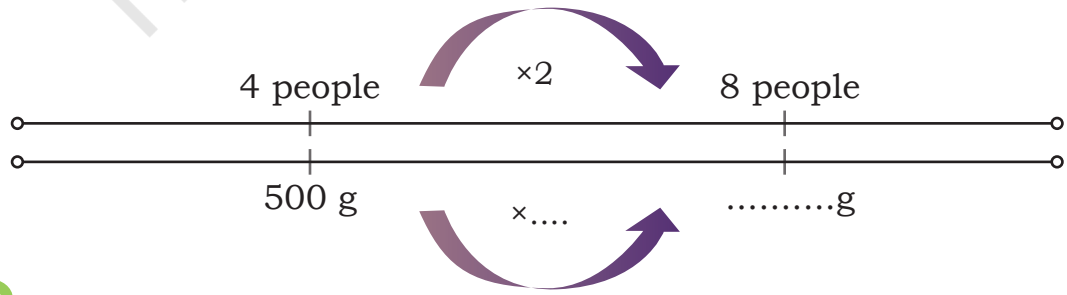
We can also convert the quantity into grams and divide
4800 ÷ 4 = ?

Let Us Do

1. The cost of some grocery items is given in the following table. Find the total cost of each item.

Item	Weight	Cost of 1 kg	Total cost
Rice	12 kg 500 g	₹ 60	
Flour	7 kg 250 g	₹ 40	
Sugar	5 kg	₹ 45	
Chana dal	3 kg 600 g	₹ 70	
Besan	4 kg	₹ 60	
Jaggery	1 kg 400 g	₹ 50	

2. 4 people need 500 g rice for a meal. How much rice will be needed for 8 people if they eat similar quantity of rice?



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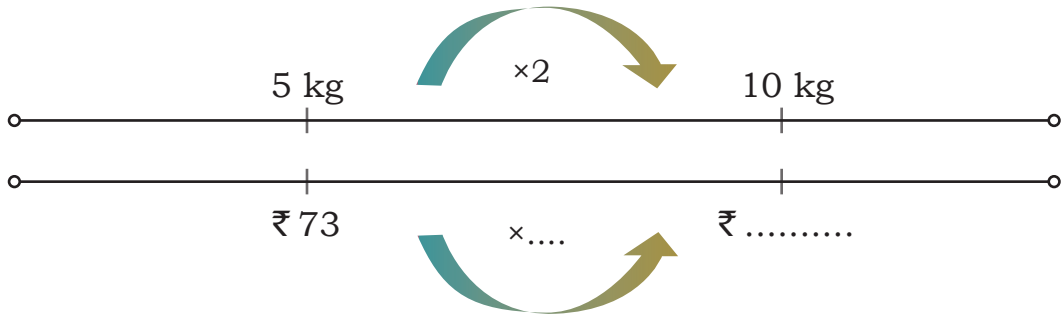
3. 5 kg of tomatoes cost ₹ 73. How much will 10 kg of tomatoes cost?



4. Nitesh is a scrap dealer. How much would he have paid for
   (a) 16 kg of old newspaper, if he paid ₹ 8 for every 1 kg of newspaper?
   (b) 20 kg iron, if he paid ₹ 200 for every 10 kg of iron?
   (c) 10 kg plastic, if he paid ₹ 30 for 5 kg of plastic?

   Make double number lines for answering (b) and (c).

Measuring Capacity

1. You must have seen tea being prepared at your home. How much water and milk do we need to make 2 cups of tea?

   Do we need 1 *l* of water to make 2 cups of tea?

   Is 500 *ml* of water enough for 2 cups of tea?

2. A bucket can hold a maximum of 20 *ml* of water. Is this statement correct? Which unit should be used in such a situation?

Big to Small, Small to Big

1. Ramiz brings a 500 ml water bottle to school. He drinks two bottles at school. How much water does he drink at school?

   Ramiz drinks _____ *ml* + _____ *ml* = _____ *ml.*

   Ramiz drinks ____ *l* of water in a day.

2. Muskaan drinks 3 *l* of water in a day. How many times would she need to refill a 500 *ml* water bottle? _____.

   Muskaan drinks _____ *ml* of water in a day.

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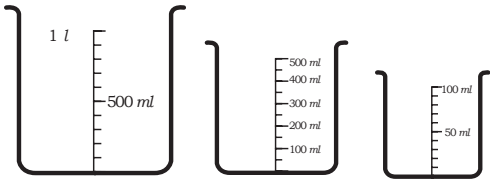
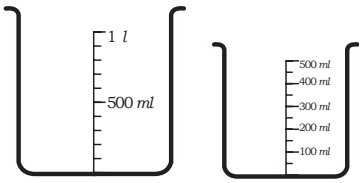
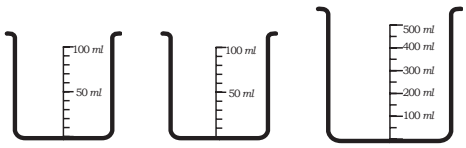
3. Write the total capacity of the following containers in each blank.



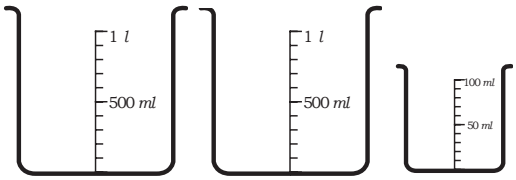
_____ *l* _____ *ml*



_____ *l* _____ *ml*



_____ *l* _____ *ml*



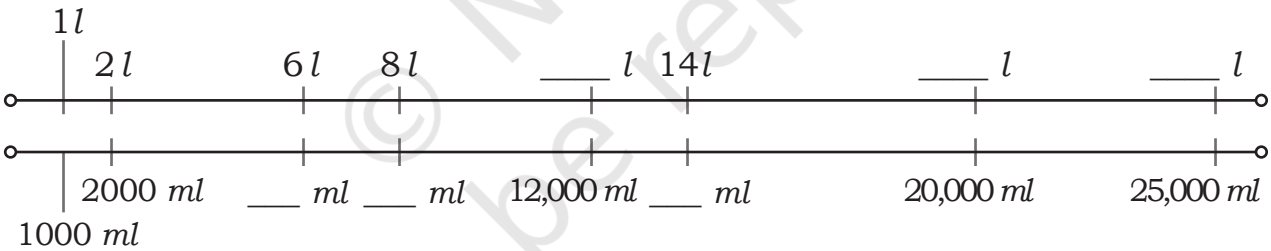
_____ *l* _____ *ml*

Different Units but Same Measure

The Milkman's Delivery

Khayal *chacha* delivers fresh cow milk to homes. Bhalerao's family orders 2*l* of milk everyday.

This family has a vessel marked in *ml* only. What mark will you see in the vessel corresponding to 2*l*?



Khayal *chacha* delivers the following amounts of milk each week to different families.

Family	Milk Delivered in a Week in *l*	Quantity in *ml*
Arora's	8	
Nair's	14	
Shrivastava's		12,000
Das's		20,000
Rao's		25,000

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Dev's family needs 1 *l* milk every day. On Sunday, they need 500 *ml* more.

Quantity of milk they need on Sunday = 1 *l* + 500 *ml*

= 1,000 *ml* + 500 *ml* = 1,500 *ml*.

Let Us Think

1. Mary and Daisy filled their bottle with 1*l* 400 *ml* of water. They wondered about the capacity of the bottle in *ml*. How much is it?

Who do you think is correct and why?

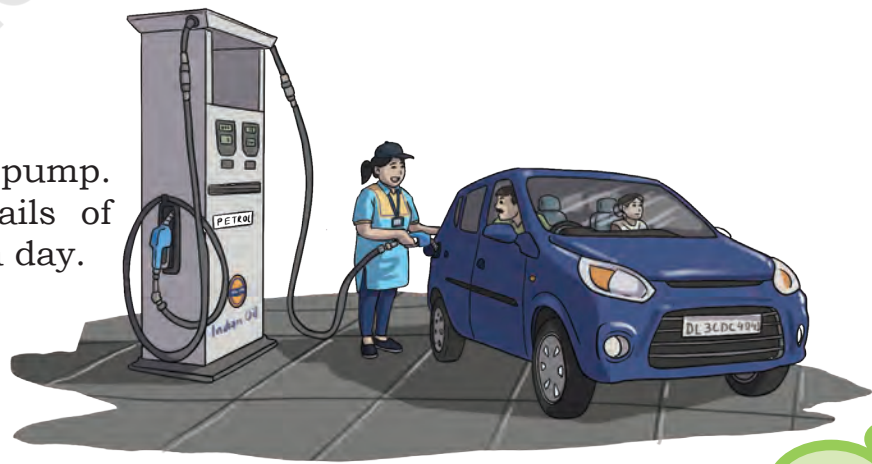
2. Convert and fill in the blanks appropriately. You can use the double number line given earlier.

(a) 3 *l* 8 *ml* = _____*ml* (b) 9 *l* 90 *ml* = _____ *ml* (c) 14,075 *ml* = ____*l* ____*ml*

(d) 8 *l* 86 *ml* = ____ *ml* (e) 12,200 ml = ____*l* _____*ml* (f) 18,350 ml = ____*l* ____*ml*

Let Us Compare

1. Kiran owns a petrol pump. She records the details of the sales of petrol in a day.



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2.

Vehicle	No. of Vehicles	Quantity of Fuel in Each Vehicle (in litres)	Total Quantity of Fuel (in litres)
Truck	3	500	
Bus	6	300	
Car	10	50	
Auto Rickshaw	12	8	
Two-wheeler	25	5	

(a) How much more fuel is bought for buses than for trucks?

(b) What is the total quantity of fuel filled from the petrol pump on that day?

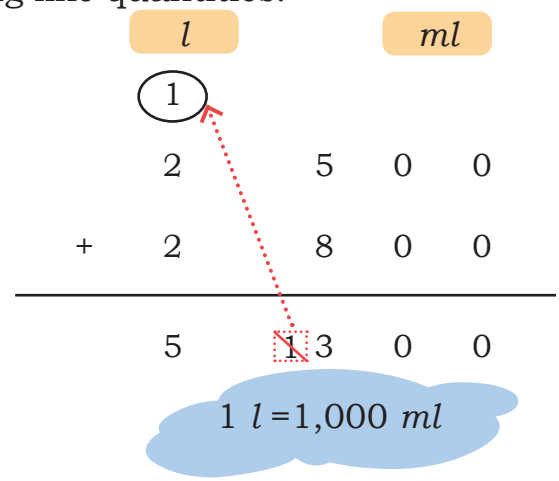
3. Compare the following quantities using the signs <, =, >.

(a) 5 *l* 600 *ml*	_____	5,400 *ml*
(b) 10 *l* 100 *ml*	_____	1 *l* 600 *ml*
(c) 190 *ml* + 800 *ml*	_____	800 *ml* +109 *ml*
(d) 3 *l* 600 *ml*	_____	3,600 *ml*
(e) 4 *l* 50 *ml*	_____	4 *l* 500 *ml*

4. Sam and Tina fill petrol in their bikes. Tina bought 2 *l* 500 *ml* of petrol. Sam bought 2 *l* 800 *ml* more petrol than Tina. How much petrol did Sam buy?

Sam found the quantity of petrol by adding like quantities.

2 *l* 500 *ml* + 2 *l* 800 *ml*
= 2 *l* + 2 *l* and 500 *ml* + 800 *ml*
= 4 *l* and 1,300 *ml*
= 4 *l* and 1 *l* and 300 *ml*
= 5 *l* 300 *ml*.



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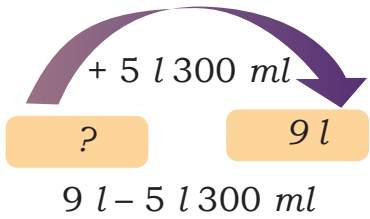
Tina converted the quantities into *ml*, that is, 2,500 *ml* and 2,800 *ml*.

	(1)		*ml*	
	2	5	0	0
+	2	8	0	0
	5	1	3	0	0

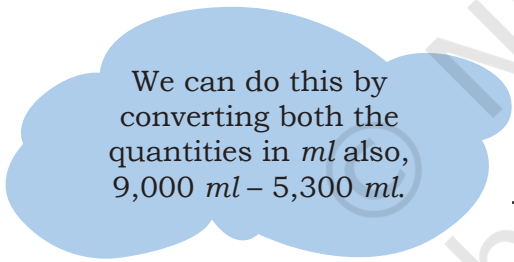
Total quantity of petrol bought by Sam = 2,500 *ml* + 2,800 *ml* = 5,300 *ml* = 5 *l* 300 *ml*.

After refueling, Sam found his fuel gauge reading 9 *l*. How much fuel did his bike have before refueling?

Quantity of fuel Sam's bike had before refueling is–



9 *l* – 5 *l* 300 *ml*



Convert 1 *l* = 1,000 *ml*.

	l		*ml*		
	(8)		(10)		
	~~9~~		0	0	0
–	5		3	0	0
	3		7	0	0

Sam's bike had 3 *l* 700 *ml* of fuel before refuelling.

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Note for Teachers: Explain the addition and subtraction algorithm as was done in the case of weight. Encourage the learners to choose the strategy they are comfortable with. Teachers can create several more problems like this. To help learners master such problem-solving, choose numbers mindfully—preferably multiples of 10, 100, or 1000.

Let Us Solve

1. Riya is filling water bottles for a picnic. She fills one 2 *l* bottle and four 500 *ml* bottles. Her friend, Aarav fills three 750 *ml* bottles. Who filled more water, Riya or Aarav? How much more?

2. A bottle of milk is poured equally into 8 glasses, leaving 120 *ml* of milk in the bottle.

   (a) If each glass has a capacity of 360 *ml*, what is the total capacity of 8 glasses?

   (b) How much milk was there in the bottle initially?

   (c) If 1 *l* of milk costs ₹ 40, how much will 3 *l* milk cost?

3. A juice vendor has a 5 *l* container of orange juice. Each glass has a capacity 250 *ml*.

   (a) How many full glasses can he serve before the container becomes empty?

   (b) If he has already served 10 glasses, how much juice is left?

   (c) If 250 *ml* of juice is sold at ₹ 25, how much will he earn by selling 5 *l* juice?

4. In a factory, 8 *l* 400 *ml* of oil needs to be equally poured into 7 containers for storage. How much oil will each container hold?

5. If one container can hold 1 *l* 75 *ml* of buttermilk, how much buttermilk will be there in 8 such containers?

Use the double number line whenever needed to solve such problems.

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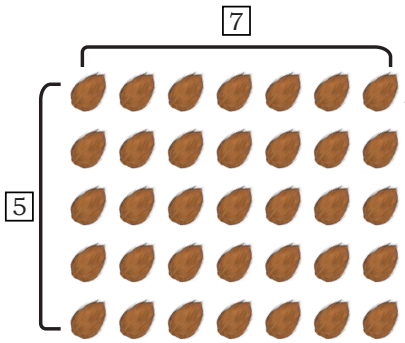
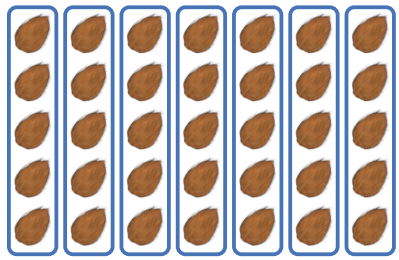
Chapter 9

Coconut Farm

Observe the following array of coconuts. Write two division facts using the given multiplication fact.

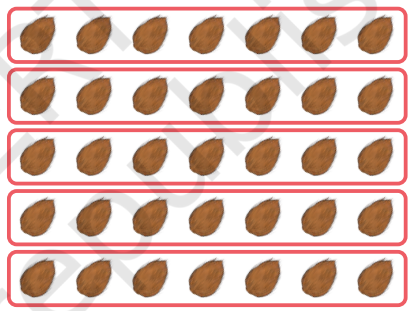


5 × 7 = 35



35 ÷ 7 = 5

35 split into 7 groups has 5 in each group.



35 ÷ 5 = 7

35 split into 5 groups has 7 in each group.

Think and answer

35 ÷ 1 = _____

Division Facts

5 × 7 = 35

35 ÷ 5 = 7

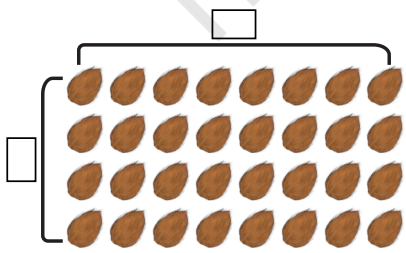
35 ÷ 7 = 5

Dividend (N) Divisor (D) Quotient (Q)

Notice!

Dividend (N) = Divisor (D) × Quotient (Q)

Write the appropriate multiplication fact for the array shown below. Write two division facts that follow from the multiplication fact.



_____ × _____ = _____

_____ ÷ _____ = _____

_____ ÷ _____ = _____

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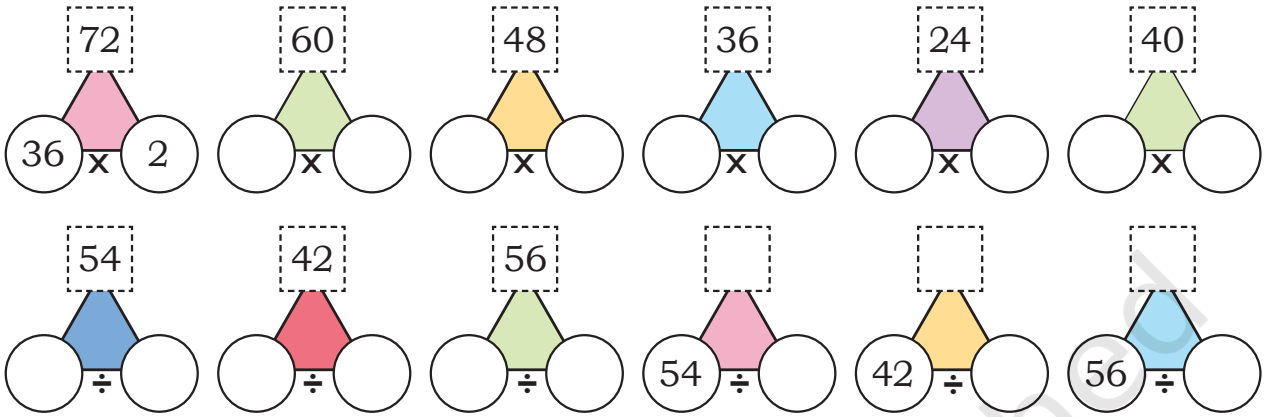
Let Us Play

Identify the numbers that can fill the circles such that the numbers in the squares are the products or the quotients of the numbers in the circles.



Let Us Do

1. Solve the following multiplication problems. Write two division statements in each case.

30 × 30 = _____

_____ ÷ _____ = _____

_____ ÷ _____ = _____

15 × 60 = _____

_____

_____

400 × 8 = _____

_____

_____

200 × 16 = _____

_____

_____

Observe the relationship between the divisor, dividend, and quotient.

Note for Teachers: Encourage the learners to recognise the connection between multiplication and division. Help them observe that every multiplication statement can lead to two related division statements. Help them notice the relationship between the number, divisor, and quotient. Provide opportunities to practice multiplication tables through games and puzzles like the ones above.

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2. Solve the following division problems. Notice the patterns and discuss in class.

How many 3s in 150?

____ × 3 = 150

5 × _____ = 500

150 ÷ 3 = _____	80 ÷ 4 = _____	500 ÷ 5 = _____
100 ÷ 10 = _____	300 ÷ 100 = _____	500 ÷ 50 = _____
200 ÷ 20 = _____	440 ÷ 44 = _____	630 ÷ 63 = _____

44 × __ = 440

Patterns in Division and Place Value

10 × _____ = 1000

37 × _____ = 3700

1000 ÷ 10 = _____	1000 ÷ 100 = _____	1600 ÷ 4 = _____
2000 ÷ 2 = _____	2000 ÷ 20 = _____	3700 ÷ 37 = _____
3300 ÷ 3 = _____	3300 ÷ 300 = _____	4000 ÷ 40 = _____

Now fill the place value chart.

Problem	H	T	O
40 ÷ 10 =			4
400 ÷ 10 =		4	0
4000 ÷ 10 =	4	0	0
700 ÷ 70 =			
1400 ÷ 100 =			
220 ÷ 20 =			
2200 ÷ 20 =			

What is happening to the quotients in each case? Discuss.

What patterns do you notice here?

Problem	H	T	O
110 ÷ 11 =			
860 ÷ 86 =			
7500 ÷ 750 =			
8800 ÷ 88 =			
2400 ÷ 24 =			
440 ÷ 22 =			

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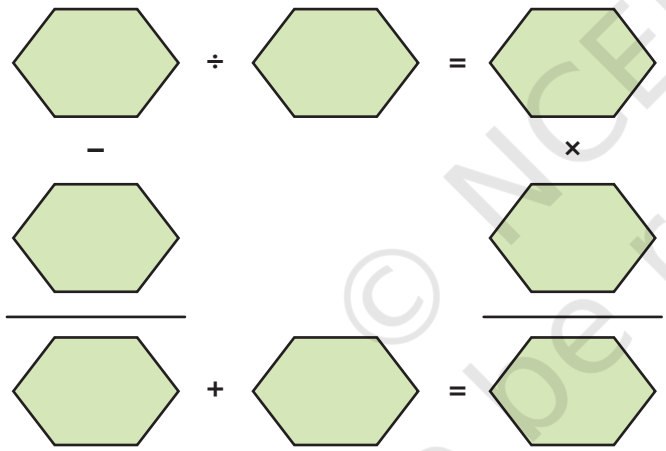
Let Us Do

1. Sabina cycles 160 km in 20 days and the same distance each day. How many kilometres does she cycle each day?
2. How many notes of ₹100 does Seema need to carry if she wants to buy coconuts worth ₹4200?
3. The owner of an electric store has decided to distribute ₹5500 equally amongst 5 of his employees as a Diwali gift. What amount will each employee get?

   What will happen if he distributes the same amount of money among 10 employees? Will each employee get more or less? How much money would he have to distribute if everyone must get the same amount as earlier?
4. Place the numbers 1 to 8 in the following boxes so that all the four operations, division, multiplication, addition and subtraction are correct. No number must be repeated.



How did you think about solving this?

Is there more than one answer?

5. Fill in the blanks

   (a) _____ ÷ 18 = 100.
   (b) _____ ÷ 10 = 610.
   (c) _____ ÷ 100 = 72.
   (d) _____ ÷ 100 = 10.
   (e) 870 ÷ _____ = 87.
   (f) _____ ÷ 100 = 70.
   (g) 200 ÷ _____ = 2.
   (h) 130 ÷ _____ = 13.

Note for Teachers: Encourage learners to notice relationships between simple multiplication facts and multiples of tens and hundreds in division problems like the above.

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Mental Strategies for Division

Observe the division carefully.

I can split the number into convenient parts.

1. **1248 ÷ 6**
   1248 = 1200 + 48
   I know 1200 ÷ 6 = 200
   and 48 ÷ 6 = 8
   So, 1248 ÷ 6 = 200 + 8 = 208.

I can do it in a different way.

2. **1992 ÷ 4**
   1992 = 2000 – 8
   2000 ÷ 4 = 500
   8 ÷ 4 = 2
   So, 1992 ÷ 4 = 500 – 2 = 498.

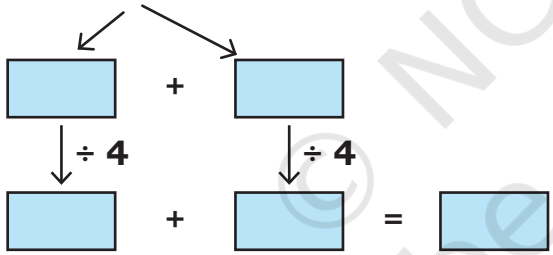
Can you give 5 such examples where you can split the number conveniently?

For which other divisors and dividend might this strategy of repeated halving work?

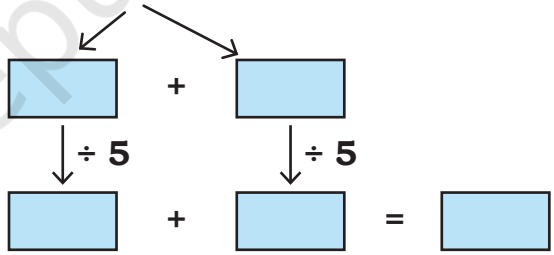
3. 128 ÷ 4
   To divide by 4, I can halve twice.
   Half of 128 is 64.
   Half of 64 is 32.

Try It!

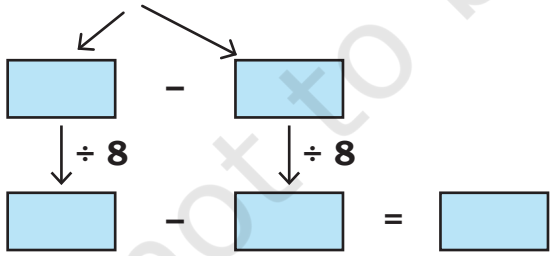
1. 64 ÷ 4



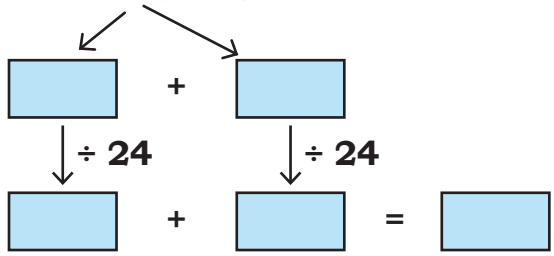
2. 265 ÷ 5



3. 1560 ÷ 8



4. 4824 ÷ 24



5. 168 ÷ 8 → Halve 168 → ☐ → Halve ____ → ☐ → Halve ____ → ☐

6. 144 ÷ 4 → Halve 144 → ☐ → Halve ____ → ☐

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Let Us Solve

Solve the following problems using strategies used in the previous question.

(a)	256 ÷ 4	(c)	147 ÷ 7	(e)	648 ÷ 12	(g)	775 ÷ 25
(b)	545 ÷ 5	(d)	1212 ÷ 6	(f)	9648 ÷ 48	(h)	796 ÷ 4

Susie's Farm in Kerala

1. Susie and Sunitha have a large coconut farm and they have harvested 1,117 coconuts in April.

   They sold 582 coconuts equally to 6 regular customers. How many coconuts did each customer get?

   They sold 582 ÷ 6 coconuts to each customer.

```
6) 582 (20+20+20+20+10+7
  -120
  ----
   462
  -120
  ----
   342
  -120
  ----
   222
  -120
  ----
   102
   -60
  ----
    42
   -42
  ----
    00
```

Susie's solution

Estimate the answer first. Do you realise that each customer will likely get less than 100 coconuts?

```
          9 7
6) 582 (90 + 7
  -540
  ----
    42
   -42
  ----
    00
```

Sunitha says she has a better way to do this

Each customer gets 97 coconuts.

Do you think Sunitha's method is better? Discuss which one you would prefer and why.

Each bag can hold 25 coconuts. How many bags would be needed to pack 97 coconuts?

3 bags will hold 75 coconuts. They will need another bag to fill the remaining coconuts. So, each person will get 4 bags.

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2. They pack the remaining coconuts for drying and extracting oil. They can pack 25 coconuts in each bag. How many bags will they need to pack the remaining coconuts?

The number of coconuts left after selling 582 coconuts, is 1117 – 582 = 535.

The number of bags needed is 535 ÷ 25.

Guess the number of bags needed. Use the strategies learnt.

```
                 2 1
25) 535 (20 + 1
   –500
   ----
     35
    –25
   ----
     10
```

Let us take away maximum groups of 25 in multiples of tens. Can we write 30 here?

Remainder (R)

They need 21 full bags and 1 more bag to pack the 10 remaining coconuts, that is, 22 bags.

Let Us Learn to Divide

726 ÷ 4

```
4) 726 (100 + ____ + ____
  –
  ----
   326
  –320
  ----
     6
  –
  ----
     2
```

Could we have written 200 here?

902 ÷ 16

```
16) 902 (____ + 6
   –800
   ----
   – 96
   ----
     6
```

What should we write here so that we get a number close to 902 but less than it? Could we have multiplied 16 by a larger tens?

Sometimes, the divisor (D) does not completely divide the dividend (N) and leaves a remainder (R). What is the relationship between the dividend (N) and divisor (D), quotient (Q), and remainder (R)? Try to find out!

Is 726 = 4 × 181? Yes/No. So, 726 = 4 × 181 + _____.

Is 902 = 16 × 56? Yes/No. So, 902 = 16 × 56 + _____.

N = D × Q + R

Note for Teachers: Encourage the learners to divide using partial quotients and work like Susie. But we may also push them to choose a more optimal strategy (like Sunitha's) by choosing the multiplier or quotient more carefully to reduce the number of steps. This will help us reach closer to the standard algorithm.

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Let Us Solve

Solve the following word problems

1. Rani is planning to host a party. She estimates that 250 guests will attend. She plans to serve one samosa to each guest. Samosas are available in packs of 6 or 8. Which pack should Rani buy? Explain your answer.
2. 342 students from a school are going on a trip to the Science Park. Each bus can carry a maximum of of 41 students. How many buses does the school need to arrange ?
3. Sofia has only ₹50 and ₹20 notes. She needs to pay ₹520 using these notes. How many ₹50 and ₹20 notes does she need to make ₹520? Find out the different possible combinations.
4. Three friends decide to split the money spent on their picnic equally. They buy snacks and sweets for ₹157, juice and fruits for ₹124 and *pulav* and *paratha* for ₹136. How much should each person pay to share the cost equally?
5. Identify the remainder, if any. Check if N = D × Q + R.
   (a) 887 ÷ 3
   (b) 283 ÷ 8
   (c) 745 ÷ 5
   (d) 767 ÷ 26
   (e) 530 ÷ 41
   (f) 888 ÷ 67

Kalpavruksha Coconut Oil

1. In a particular year, Susie and Sunitha used 4376 coconuts for extracting coconut oil. They can extract 1*l* of oil from 8 coconuts. What quantity of oil were they able to extract?

   They would get 4376 ÷ 8 litres of coconut oil.

```
8) 4376 (200+200+100+40+7
  -1600
   2776
  -1600
   1176
  - 800
    376
   -320
     56
    -56
     00
```

Susie's solution

```
                 5  4  7
8) 4376 (500 + 40 + 7
  -4000
    376
   -320
     56
    -56
     00
```

Sunitha shows her solution again

They extracted 547 *l* of oil in the year.

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	H	T	O
	5	4	7
×	1	7	5

How much will they earn if they sell the oil at ₹175 for 1 *l*?
They will earn ₹ 547 × 175. Find out.

2. Coconut husk is used for making coir. Coir is a natural fibre used in gardening, farming, boat making, and making decorative items.

Susie and Sunitha's farm sells coconut husk at ₹23 per kilogram. They earned ₹9913 from the sale of husk in May. What quantity of husk did they sell in May?

The quantity of husk sold in May is 9913 ÷ 23 kg.

Make a guess first.

4 3 1

23) 9913 (400 + 30 + 1
–9200
713
–690
23
–23
00

What would happen if 23 is multiplied by 300 or 500?

Let us take away maximum groups of 23 in multiples of hundreds and tens.

Susie and Sunitha's farm sold 431 kg of coconut husk in May.

3. In the hot summer months, tender coconuts are sold for ₹35. Ibrahim earns ₹8890 in a week. How many tender coconuts did he sell?
The number of tender coconuts sold by Ibrahim is 8890 ÷ 35.

_ 5 _

35) 8890 (____ + 50 + ____
–7000
1890
–____
140
–____
00

Ibrahim sold _____ tender coconuts.

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Ibrahim had bought the tender coconuts for ₹20 each. How much extra money did he earn by selling the coconuts at ₹35?

The cost of _____ coconuts at ₹20 each = _____ × ₹ 20 = ₹_____.

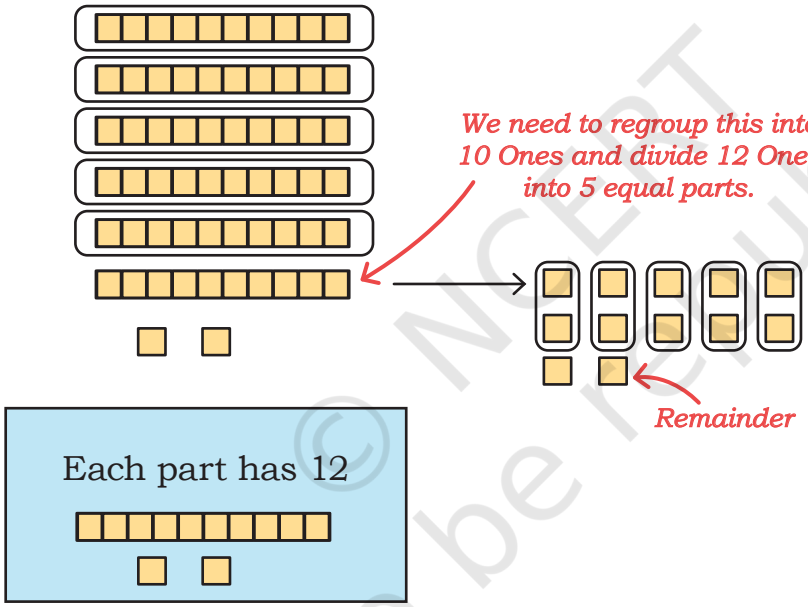
He earned ₹8890 from the sale.

The extra amount he earned is ₹8890 – ₹_____ = ₹_____.

Division Using Place Value

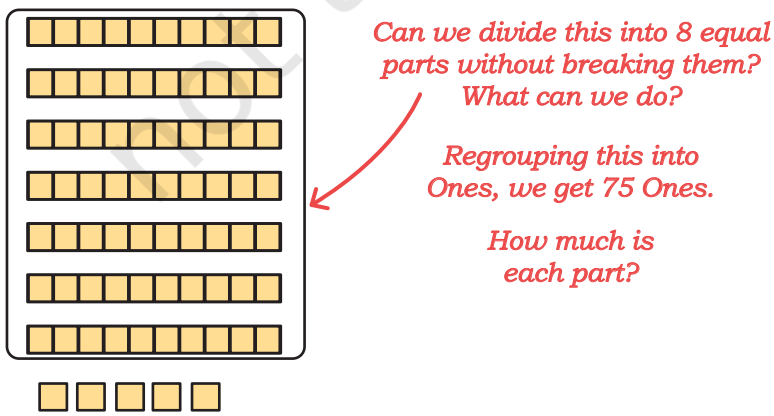
Sunitha's mother has 62 candies to be distributed equally among 5 children. How many candies would each child get? She shows the following way of doing division using place value.

1. 62 ÷ 5 → Divide 62 into 5 equal parts.




```
      T O
5) 62 (1  2
  –5↓
  ----
   12  (Ones)
  –10
  ----
    2
```

2. 75 ÷ 8 → Divide 75 into 8 equal parts.




```
      T O
8) 75 (0  9
  –72  (Ones)
  ----
    3
```

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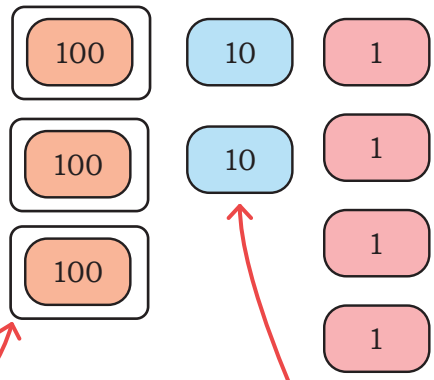
3. 324 ÷ 3 → Divide 324 into 3 equal parts.

324 = 3 Hundreds + 2 Tens + 4 Ones
3 Hundreds ÷ 3 = 1 Hundred.

2 Tens ÷ 3 → Not possible without regrouping, so everyone gets 0 Tens.

Regroup 2 Tens into Ones.
20 Ones + 4 Ones = 24 Ones.

24 Ones ÷ 3 = 8 Ones.



H	T	O

3) 324 (1 0 8
−3 (Hundreds)
2 (Tens)
−0
24 (Ones)
−24
00

4. 136 ÷ 6 → Divide 136 into 6 equal parts.

136 = 1 Hundred + 3 Tens + 6 Ones.

1 Hundred ÷ 6 → not possible without regrouping into Tens

Regroup 1 Hundred into 10 Tens.

Total 13 Tens. Continue dividing.

H	T	O

6) 136 (0 2 2
−12 (Tens)
16 (Ones)
−12
4

Can you tell just by looking at the divisor and dividend, how many digits the quotient would have? Look at the problems above and find this out. Explain your thoughts.

Note for Teachers: Place-value based division is commonly used by adults. Learners often struggle with long division, especially correctly placing zeros at different positions of the quotient. Encourage students to use place-value based division, but if they find it difficult, they can use the partial quotients method instead which reduces the chances of errors.

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Let Us Divide

(a) 7,032 ÷ 6

6) 7,032 (1,000 + ____ + 70 + ____
−
1,032
− 600
432
−
12
−
____

7,032 ÷ 6

Th	H	T	O

6) 7,032 (1 1 7 2
−6↓ (Thousands)
10 (Hundreds)
− 6↓
43 (Tens)
−42↓
12 (Ones)
− 12
0

(b) 3,005 ÷ 5

5) 3,005 (____ + ____
−3,000
5
−
0

3,005 ÷ 5

Th	H	T	O

5) 3,005 (__ __ 0 __
−30↓ (Hundreds)
00 (Tens)
−00↓
0__ (Ones)
− 5
0

Discuss why we have to write this 0 here.

(c) 2,874 ÷ 14

14) 2,874 (____ + ____
−2,800
−
_____

2,874 ÷ 14

Th	H	T	O

14) 2,874 (__ __ __ __
−28↓ (Hundreds)
( )
−
7__ ( )
−
_____

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(d) 9,805 ÷ 32

32) 9,805 (____ + ____

–

_____

205

–

_____

9,805 ÷ 32

Th H T O

32) 9,805 (____ ____ ____ ____

–

_____

(Hundreds)

( )

–

_____

( )

–

_____

Compare both solutions. Also, remember to put 0 in the right places.

Let Us Do

1. Find the missing numbers such that there is no remainder. Remember, there could be more than one solution.

4) 4 8 0 (□ □ 0	3) 9 0 6 (□ 0 □
20) 4 0 0 (□ 0	50) 1 0 0 □ (□ 0
□) 8 □ 8 (2 1 □	3) □ 3 6 (3 □ □
□) 8 8 (□ □	□) 9 □ 0 (□ □ □
□) 1 8 0 (□ □ □	□) 6,4 8 0 (□ □ □

I am a 3-digit number.
- If you divide me by 5, you get 42.
- If you multiply me by 2, you get 420.

What number am I?.

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Let Us Solve

1. A theatre company can accommodate 45 people during one show.
   (a) A total of 475 people bought tickets for a puppet show. How many shows are needed to seat all the people who bought tickets?
   (b) There are 2 shows in a day. How many days will be needed to accomodate all the people?

2. Naina bought 5 kg of ice cream as a birthday treat for her 23 friends. 400 g ice cream was left after everyone had an equal share. How much ice cream did each of her friends eat?

3. Megha packs 15 packets of ragi-oats biscuits for a 4-day group trip. Each packet contains 8 biscuits. There are 6 people in the group. If distributed evenly, how many biscuits can one person have each day.

4. Solve the following and identify the remainder, if any. Check whether $N = D \times Q + R$ in each case.

   (a) 9,045 ÷ 5
   (b) 1,034 ÷ 4
   (c) 2,504 ÷ 7
   (d) 8,900 ÷ 15
   (e) 9,876 ÷ 32
   (f) 7,506 ÷ 24

5. Find the solutions for part A. Observe the relations between the quotient, divisor and dividend and use it to answer parts B and C.

A.
(a) 340 ÷ 34 = 10
(b) 340 ÷ 17 = ___
(c) 680 ÷ 17 = ___
(d) 680 ÷ 34 = ___
(e) 170 ÷ 17 = ___
(f) 680 ÷ 68 = ___

B.
(a) 192 ÷ 4 = 48
(b) 192 ÷ 8 = ___
(c) 384 ÷ 8 = ___
(d) 384 ÷ 4 = ___
(e) 384 ÷ 8 = ___
(f) 86 ÷ 2 = ___

C.
(a) 352 ÷ 11 = 32
(b) 704 ÷ 22 = ___
(c) 704 ÷ 11 = ___
(d) 352 ÷ 22 = ___
(e) 1,408 ÷ 44 = ___

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6. A company in Mumbai organises cycle rallies from Mumbai to Panjim, Goa every year. They aim to cover 576 km in 12 days.

(a) How much distance should they cycle every day, to cover the distance evenly?

(b) After reaching Ratnagiri, they rest for 1 day. How much distance should they cycle each day to reach Goa in 4 days? Assume that they cover the distance evenly.

7. Given below are a few problems. You may need some additional information to solve these. Identify the missing information. Write the missing information and find the answer.

(a) A fruit vendor sells 6 baskets of mangoes. Each basket contains 12 mangoes. How much did the vendor earn in total?

(b) A school has 8 classrooms, and each classroom has an equal number of desks. How many desks are there in each classroom?

(c) Rahul buys 5 cricket bats for his team. The total bill is ₹3500. How much does one bat cost?

(d) A restaurant serves 125 plates of *idlis* in a day. The total earnings from selling all the *idli* plates is ₹6250. How many *idlis* are there in each plate?

8. To make one bookshelf, a carpenter needs the following things—

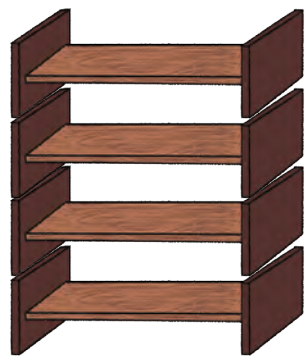
4 long wooden panels

8 short wooden panels

16 small clips

4 large clips

32 screws



The carpenter has a stock of 264 long wooden panels, 306 short wooden panels, 2400 small clips, 120 large clips, and 2800 screws. How many bookshelves can the carpenter make? Discuss your thoughts.

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Vegetable Market

Munshi Lal has a big farm in Bihar. Every Saturday, he sells the vegetables from his farm at Sundar Sabzi Mandi. *Munshi ji* maintains a detailed record of the quantity of vegetables he sends to the Mandi and the cost of each vegetable. The following table shows his record book on one Saturday.

His naughty grandson has erased some numbers from his record book. Help Munshi Lal complete the table.

S.No.	Vegetable	Cost of 1 kg	Quantity Supplied (in kg)	Total Amount
1.	Radish	₹26	78	₹ _____
2.	Potato	₹20	_____	₹2,240
3.	Cabbage	₹32	56	₹_____
4.	Green peas	_____	125	₹3,125
Total money earned through the sale				_____

What information is recorded in this table?

ACTIVITY

Ask students to collect bills from shops and read them carefully to identify the information recorded. Discuss in class.

Role-play—Students can take turns to be the shopkeeper and issue bills to their customers. Students posing as customers can calculate and pay their bills.

Let Us Solve

Divide the following. Try dividing using place values, whenever you can. Identify the remainder, if any, and check whether N = D × Q + R.

1. 506 ÷ 5
2. 918 ÷ 8
3. 8,126 ÷ 7
4. 9,324 ÷ 4
5. 876 ÷ 6
6. 7,008 ÷ 3
7. 934 ÷ 12
8. 829 ÷ 23
9. 705 ÷ 18
10. 8,704 ÷ 32
11. 6,790 ÷ 45
12. 5,074 ÷ 21

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Mathematical Statements

1. Find out whether the following statements are True (T) or False (F). A true sentence is one where both sides of the '=' sign have the same value.
   (a) 8 × 9 = 70 + 2
   (b) 20 – 6 = 7 × 3
   (c) 48 ÷ 3 = 4 × 4
   (d) 89 – 9 = 90 + 0
   (e) 25 + 10 = 45 – 10

2. Complete the following statements such that they are true.
   (a) 7 × 6 = ____ + 17
   (b) 87 + 6 = ____ × 31
   (c) 63 + ____ = 74 – 4
   (d) ____ ÷ 9 = 16 ÷ 2

3. Think about the following statements and find examples as suggested below.
   (a) "When two odd numbers are added, the sum is even."
   Find 5 examples for the above statement. Can you find an example to show that the statement can be false?

   Always true

   (b) "Multiplying a number by 2 can give an odd number."
   Give some example for this statement. Can you find any?

   Never true

   (c) "Halving a number always leads to an even number."
   Give 3 examples for the statement. Can you find 3 examples when this is not true?

   Sometimes true

4. Tick in the appropriate cell for the following statements.

Statement	Always True	Sometimes True	Never True
Adding 10 to a number gives a multiple of ten.			
Changing the order of the numbers in subtraction makes no difference.			
In multiplication, doubling one number and halving the other keeps the product the same.			
Multiplication by an odd number gives an even number.			
Multiplying a number by 5 leads to numbers which have '0' in the Ones place.			

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Chapter 10

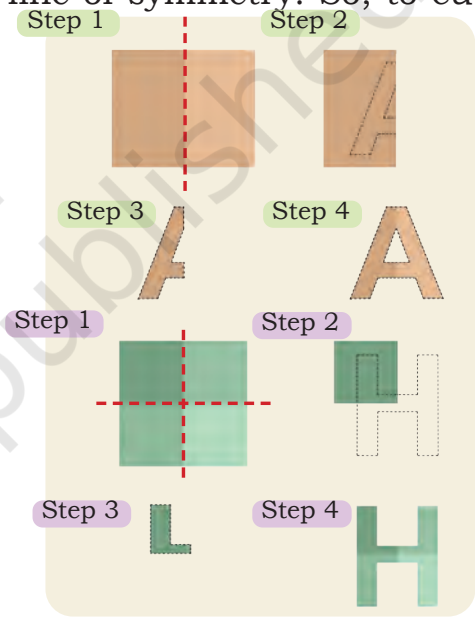
Symmetrical Designs

Alphabet Cutout

Prem and Manu want to paste 'Happy Birthday' cutouts on a wall for Lali's birthday. While preparing cutouts of letters, they observe that some letters can be cut out in an easy way.

They remember that they learnt about reflection symmetry and lines of symmetry in Grade 4. They used their knowledge of lines of symmetry to make the cutouts. The letter A has a vertical line of symmetry. So, to cut out the letter 'A'—

1. Fold a paper in half.
2. Draw half of the letter A along the fold.
3. Cut along the outline.
4. Open the paper to see the full letter A.



The letter H has two lines of symmetry.

1. Fold the paper into one-fourth (once vertically, once horizontally).
2. Draw one-fourth of the letter H along the fold.
3. Cut along the outline.
4. Open the paper to see the full letter H.

Which of the following alphabet cutouts can be made by just drawing half ($\frac{1}{2}$) or quarter ($\frac{1}{4}$) of the letter? You can do it by drawing lines of symmetry on the letters.

E N X T K V O

Which of the letters have a horizontal line of symmetry? _____
Which of the letters have a vertical line of symmetry? _____
Which letters have both vertical and horizontal lines of symmetry?_____

Let Us Do

Use lines of symmetry to make paper cutouts of diya, boat, and other designs. Look along the border of the page to find the pictures.

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Let Us Make a Windmill *Firki*

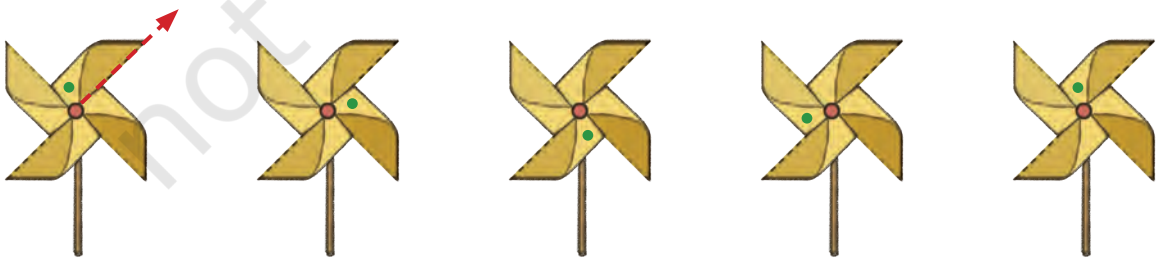
Lali makes firkis for her friends. Follow the steps given below to make your own *firki*.

1. Take a square paper.
2. Fold the paper in half diagonally to make two triangles.
3. Open and fold it the other way to make two more triangles.
4. Open it again. You will see an 'X' shape on the paper.
5. Use scissors to cut along the four lines of the 'X'. Stop cutting about halfway to the centre.
6. Take one corner of each triangle and fold it gently towards the centre of the paper. Do not press it flat.
7. Fold every other corner towards the centre.
8. Push a pin through the folded corners and the centre of the paper.
9. Push the pin through a stick or straw.

Make sure the pin is not too tight.

Check if your windmill spins when the wind is blowing.

Observe the dot in the *firki*. Does the *firki* look the same after $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, and a full turn? _____.



Initial position | $\frac{1}{4}$ turn | $\frac{1}{2}$ turn | $\frac{3}{4}$ turn | Full turn

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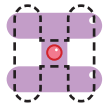
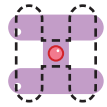
Observe the letters below. Do they look the same when turned? Dots have been marked on the letters to keep track of the orientation of letters. You may also cut out the letters and fix the centre point of the letter by a nail or use a tracing paper to check if the letter looks the same when turned.

Original letter	$\frac{1}{4}$ turn	$\frac{1}{2}$ turn	$\frac{3}{4}$ turn	Full turn	Rotational symmetry (Yes/No)
					Yes, at $\frac{1}{2}$ turn

The letter H has rotational symmetry, as it looks the same when rotated by half a turn.

A firki has rotational symmetry, as it looks the same when rotated by $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$ turn.

Let Us Do

Find symmetry in the digits.

1 2 3 4 5 6 7 8 9 0

Which digit(s) have reflection symmetry? _____

Which digit(s) have rotational symmetry? _____

Which digit(s) have both rotational and reflection symmetries? _____

Now, let us look at the following numbers: 11 , 1001

Do these have (a) rotational symmetry, (b) reflection symmetry or (c) both symmetries?

Give examples of 2-, 3-, and 4-digit numbers which have rotational symmetry, reflection symmetry, or both.

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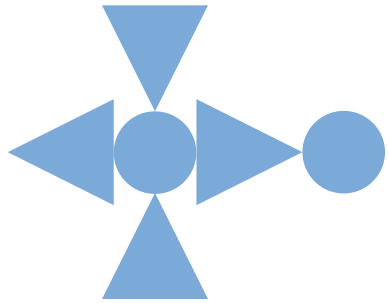
Making Designs



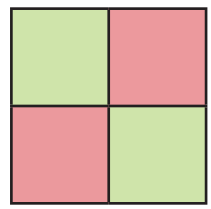
(a) Does the design have rotational symmetry? Yes/No.

(b) Try to change the design by adding some shape(s) so that the new design looks the same after a $\frac{1}{2}$ turn. Draw the new design in your notebook.

(c) Now try to modify or add more shapes so that the new design looks the same after $\frac{1}{4}$ turn. Draw the new design in your notebook.

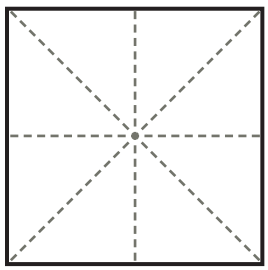
(d) Do the new designs have reflection symmetry? If yes, draw the lines of symmetry.

Let Us Think



Does this design look the same after $\frac{1}{2}$ turn? _____

Does the design look the same after $\frac{1}{4}$ turn?_____



Colour the square given in the adjoining figure using two colours so that the design looks the same after every $\frac{1}{4}$ turn.

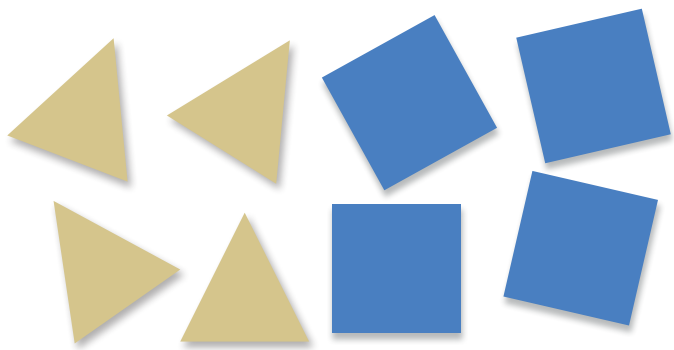
How many times does this shape look the same during a full turn?

Do these designs have reflection symmetry also? Draw the line(s) of symmetry.

Let Us Do

Cut out squares and equilateral triangles with the same side length. These are provided at the end of the book.

Make different symmetrical designs by using these two shapes.



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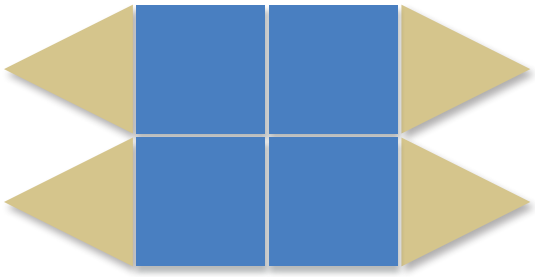


Does this shape have reflection symmetry?

If yes, draw its line(s) of symmetry.

Does it have rotational symmetry?

If yes, at which turn?

Does it have both symmetries?

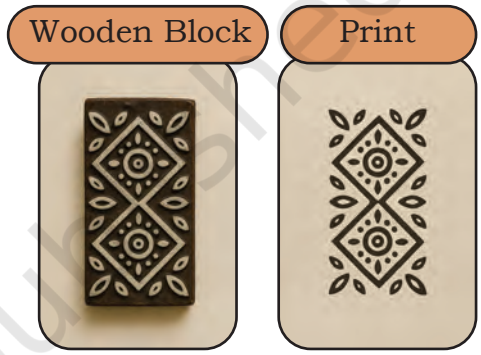
Now, make your designs. Sort your designs in 3 categories—designs with only rotational symmetry, designs with only reflection symmetry, and designs with both rotational and reflection symmetry.

Let Us Explore

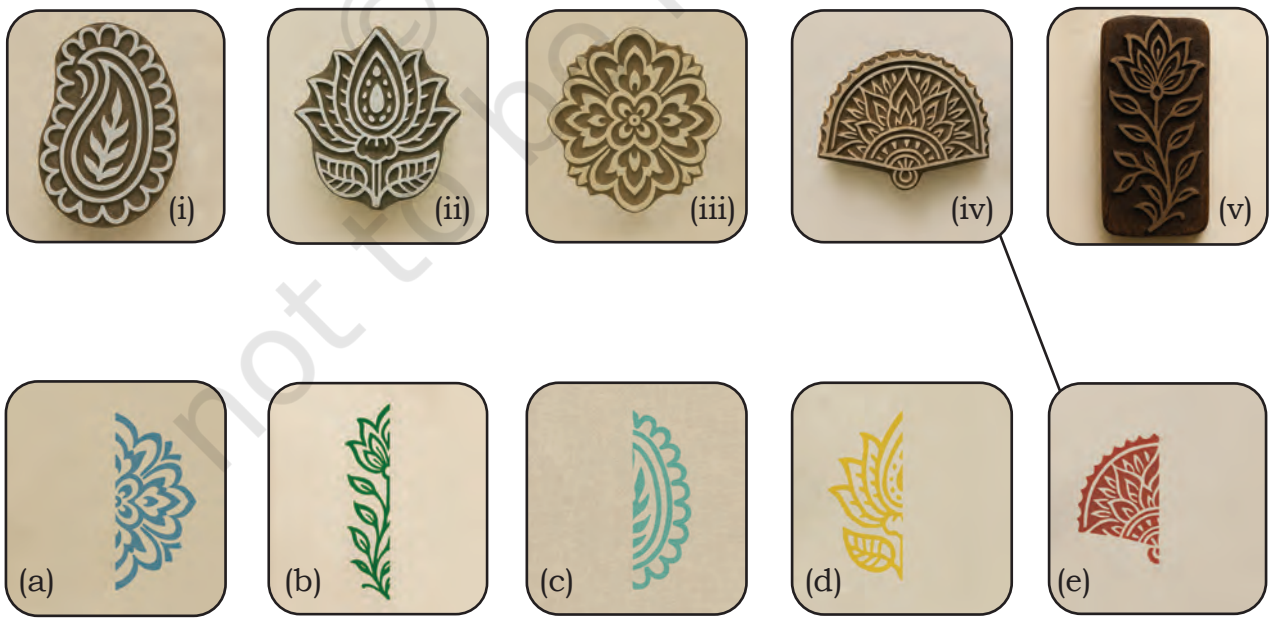
Block printing is a traditional craft of Rajasthan, known for beautiful patterns and bright colours.

Artisans use carved wooden blocks to print designs on fabric.

This art has been practised for centuries and makes Rajasthan's textiles special.



Below are images of wooden blocks and a part of their prints. Match each block to its correct print by drawing a line. One is done for you.



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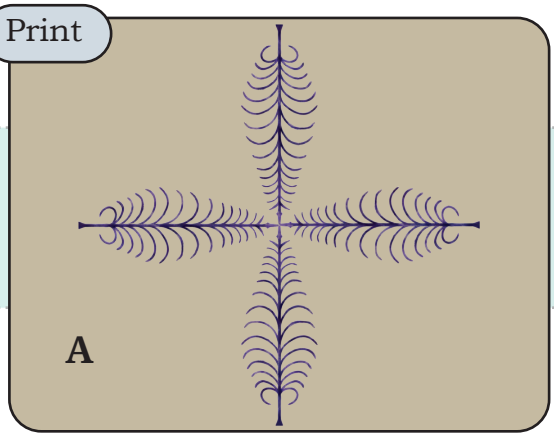
Observe the pattern made by the wooden block below. We get the final print by using the block 4 times.

Wooden Block

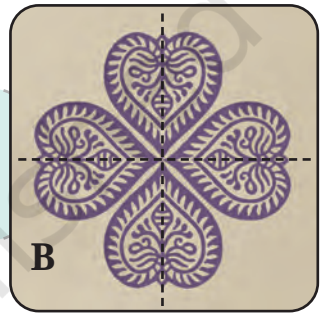
Print



A

The design A looks the same after every $\frac{1}{4}$ turn.

The design B looks the same after every _____ turn. This design has _____symmetry.



B

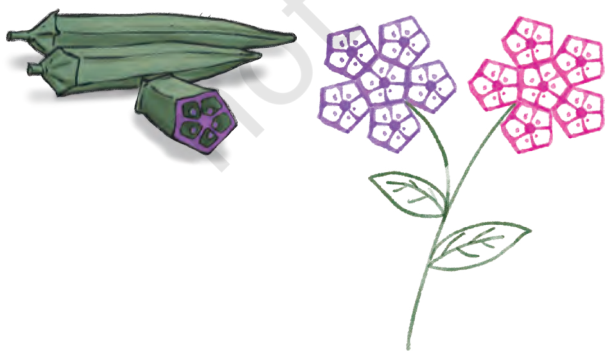
Let Us Do

Observe the shapes given on the border. Which of the shapes have reflection symmetry? Put a (✓) mark on them. Put a * on the shapes that have rotational symmetry.

Project Work

Create symmetrical patterns and designs using vegetable blocks. Some are shown below.

(a)



(b)

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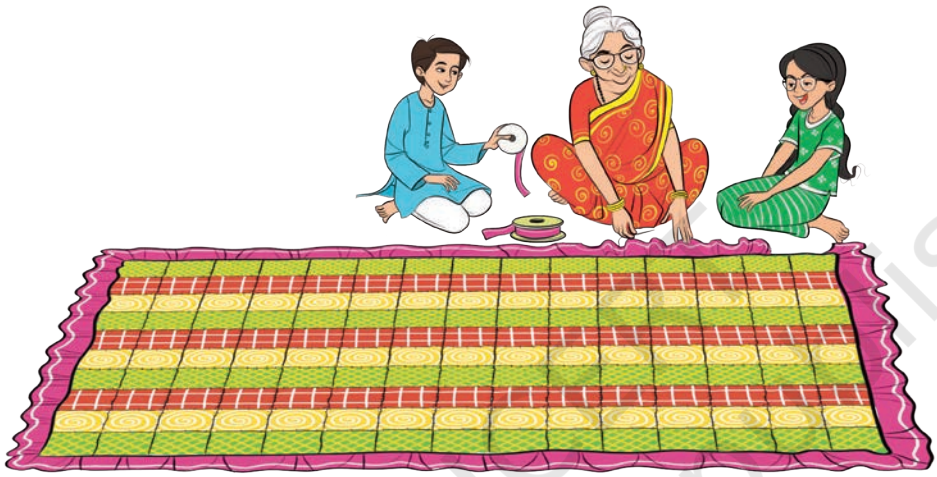
Chapter 11

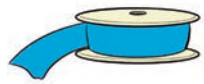
Grandmother's Quilt

Preetha and Adrit's grandmother made a quilt cover using old clothes. Now she wants to decorate it with lace. Tick the lace option that would cover the entire border of the quilt.



(i) Red lace
40 units

(ii) Green lace
50 units



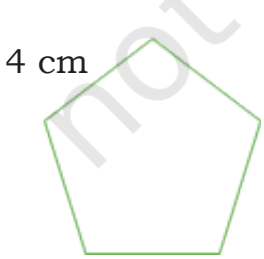
(iii) Blue lace
25 units

She decides to use two different coloured laces. How much lace of each kind will be needed to cover the entire border?

Recall that the length of the border of a shape is called its **perimeter**.

Let Us Do

1. Find the perimeter of the following shapes. All sides of the following shapes are equal.



2. Draw two rectangles each having the following perimeters.

   (a) 26 cm

   (b) 18 cm

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Preetha and Adrit's grandmother is making a rug with square patches. The picture below shows the rug. How many patches have they used to make this?

Preetha and Adrit are trying to cover their table with different shapes. Preetha covered it with triangles and circles. Adrit covered with squares and rectangles.

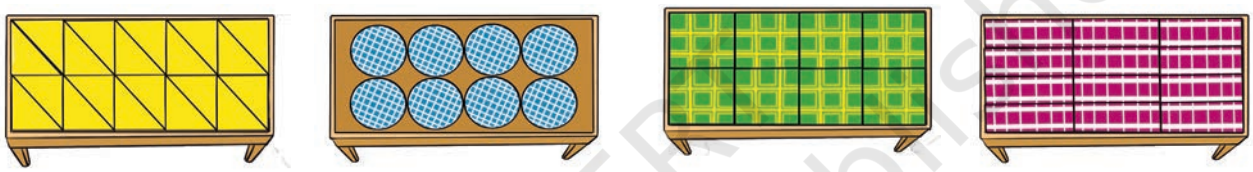

Table 1 Table 2 Table 3 Table 4

They found that _____, _____ and _____ shapes cover the top of the table without gaps and overlaps. _____ shape leaves gaps.

_____ triangles cover Table 1.

_____ squares cover Table 3.

_____ rectangles cover Table 4.

The region covered by the triangles, squares or rectangles is called the **area** of the table.

To find the area of a region, we usually fill it with shapes that tile (no gaps and overlaps), like squares, rectangles and triangles.

Do circles tile? Can we use them to cover a region?

The area of Table 1 is _____ triangle units.

The area of Table 3 is _____ square units.

The area of Table 4 is _____ rectangle units.

Now, try to cover the top of your table without gaps and overlaps with the following objects of same size.

(a) Notebooks (b) Lunch boxes

(c) Pencil boxes (d) Maths textbooks

Which of the above objects covered the region completely?

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Let Us Do

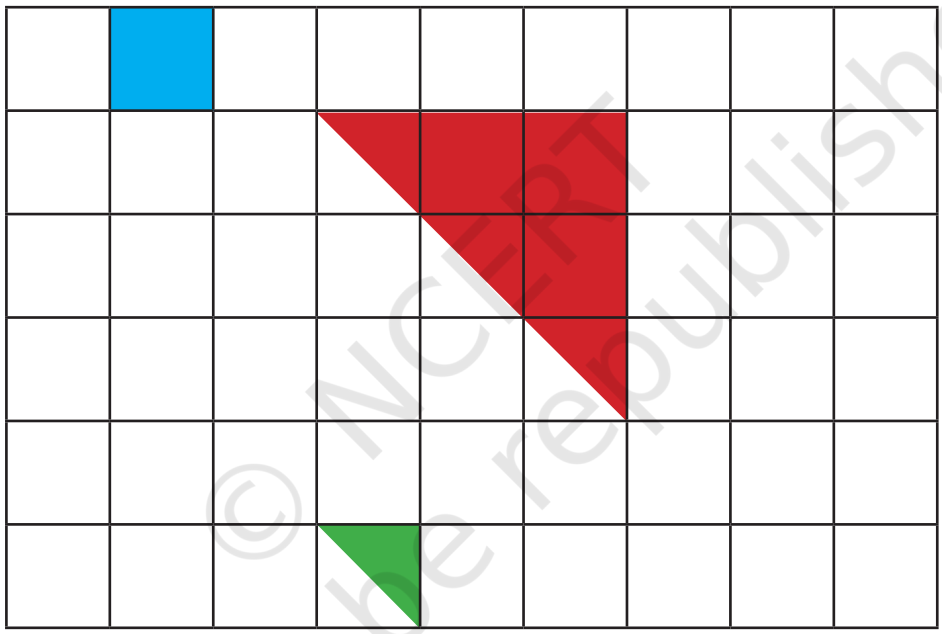
Preetha is playing with tiles. She covers her desk with different shapes as shown below.

Look at the different tiles on her desk and answer how many of the following shapes will cover the desk.

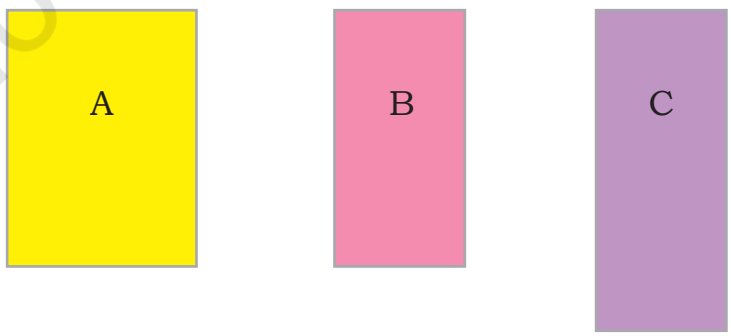
(a) Green triangles _____

(b) Red triangles _____

(c) Blue squares _____



Comparing Shapes



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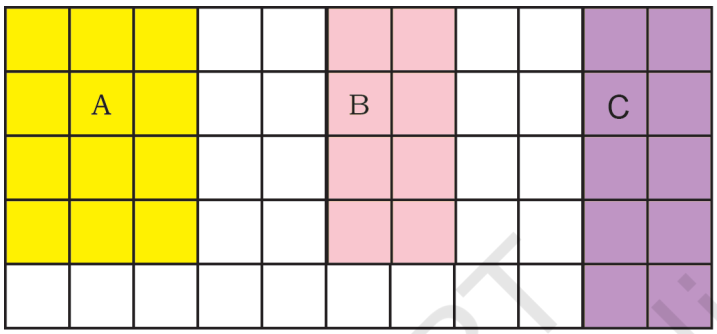
Which of the above rectangles has the largest area? Trace these shapes on to a paper and cut them to find out the one that has the largest area.

Do you see that the area of rectangle A is larger than that of B? What about B and C?

Which shape has a larger area among A and C? How will you find out?

Let us put these rectangles on a square grid. Now, can you identify the rectangle that has the largest area?

Using square grids is the most convenient way to find the area of regions. We say that the area of a square with sides 1 unit is 1 unit square.

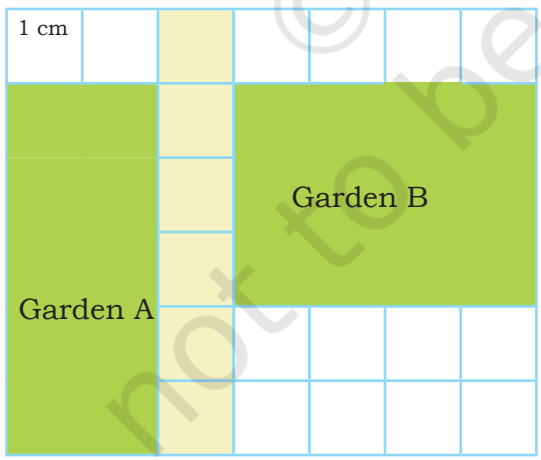


1 unit

Area = 1 unit square

Let Us Do

1. Compare the areas of the two gardens given below on the square grid. Share your observations.



Area of Garden A = _____ cm square

Area of Garden B = _____ cm square

Note for Teachers: Tiles of several shapes like triangles, rectangles, and squares can be used to measure the area of a region. We choose a square as a unit for measuring area as its sides are of equal length. Therefore, we can define the area of a unit square as 1 unit square. This allows us to measure area, similar to that of measuring length.

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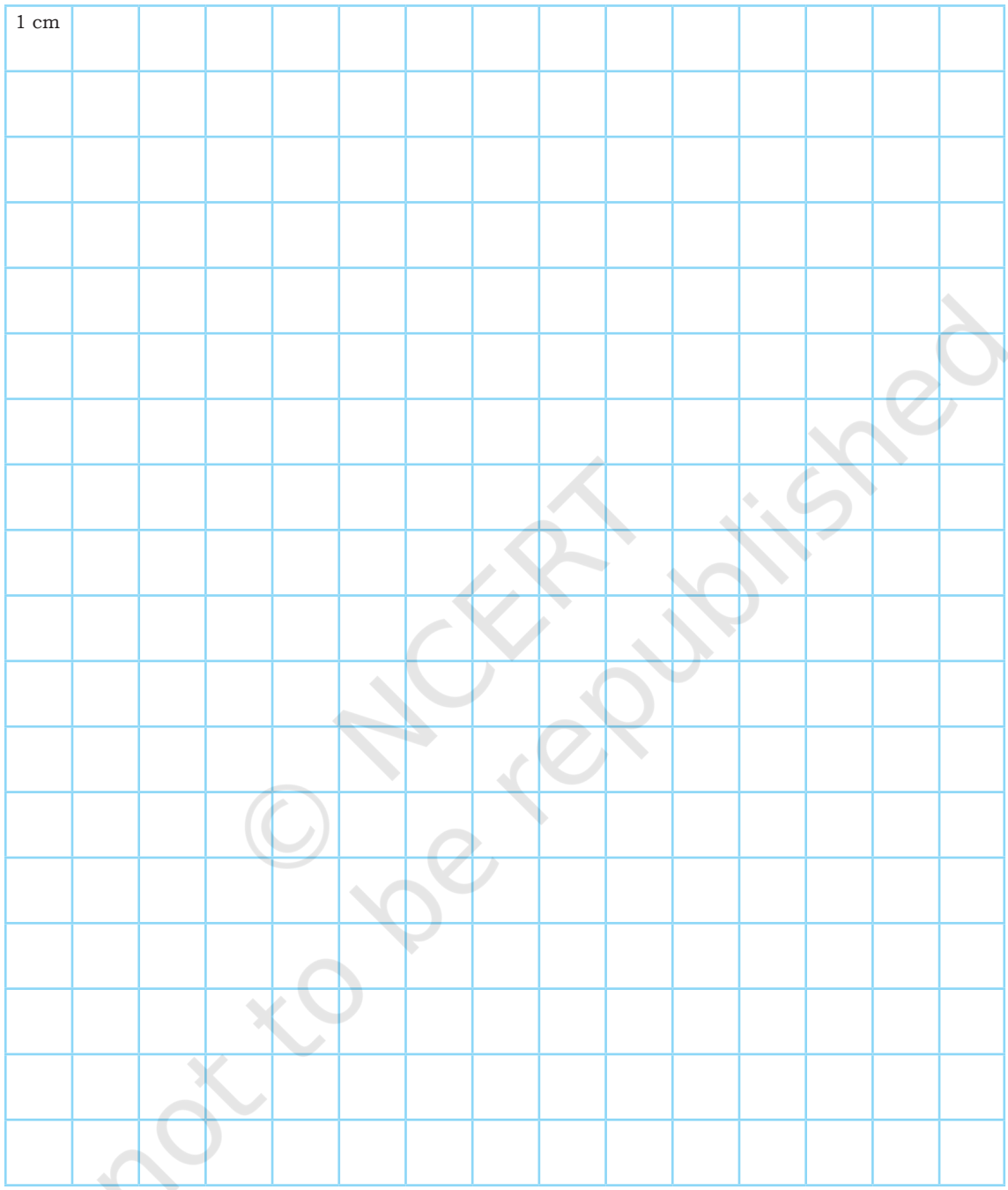
2. Trace your palm on the square grid given below and find the approximate area of your palm. Compare the area of your palm with your friend's palm. Who has a bigger palm?



3. Collect leaves of different kinds. Put them on a square grid and find their area.
   (a) Name the leaf with the largest area.
   (b) Name the leaf with the smallest area.

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4. The following mats are made of square patches of equal size. How many square patches will be required to cover each mat? Would both mats require an equal or different number of patches? Trace and cut out a small square of the size give below and find the area.

(a)

Area = _____

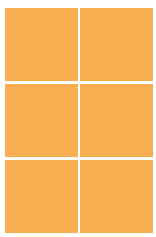
Perimeter = _____

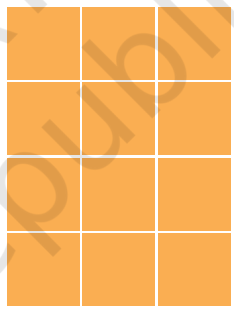
(b)

Area = _____

Perimeter = _____

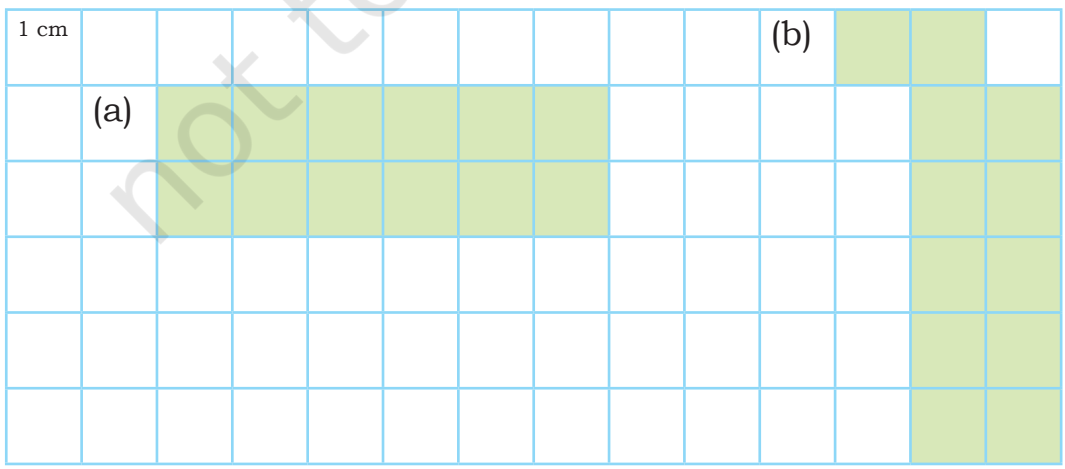
Trisha makes these two rectangles. She says, "I increased the area of my rectangle, and the perimeter increased." Do you think this is always true?





Let Us Explore

1. Tick the shapes with the same area. Find the perimeters of these shapes. What do you notice? Discuss.



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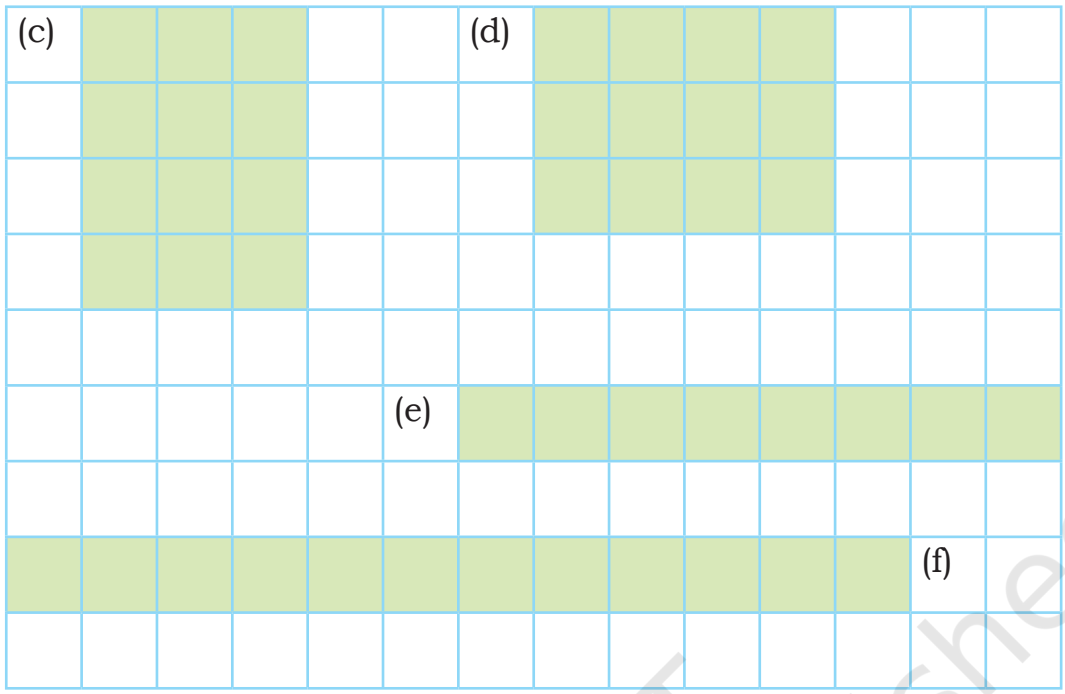
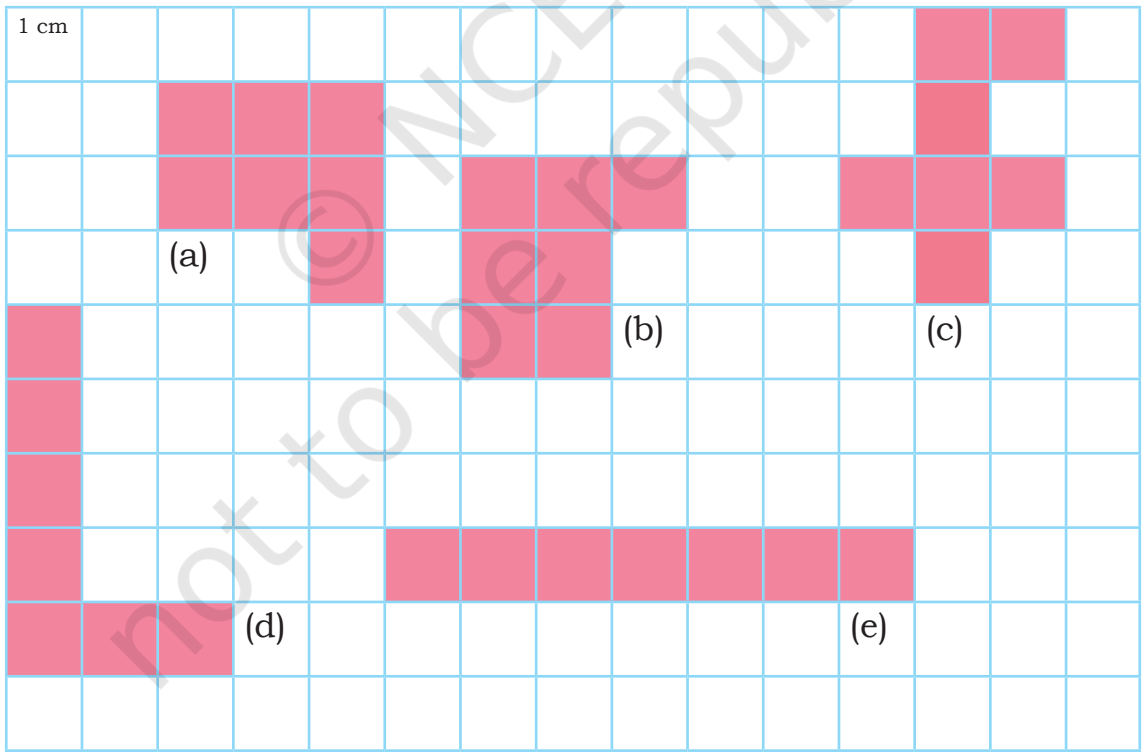


2. Tick the shapes with the same perimeter. Find the areas of these shapes. What do you notice? Discuss.



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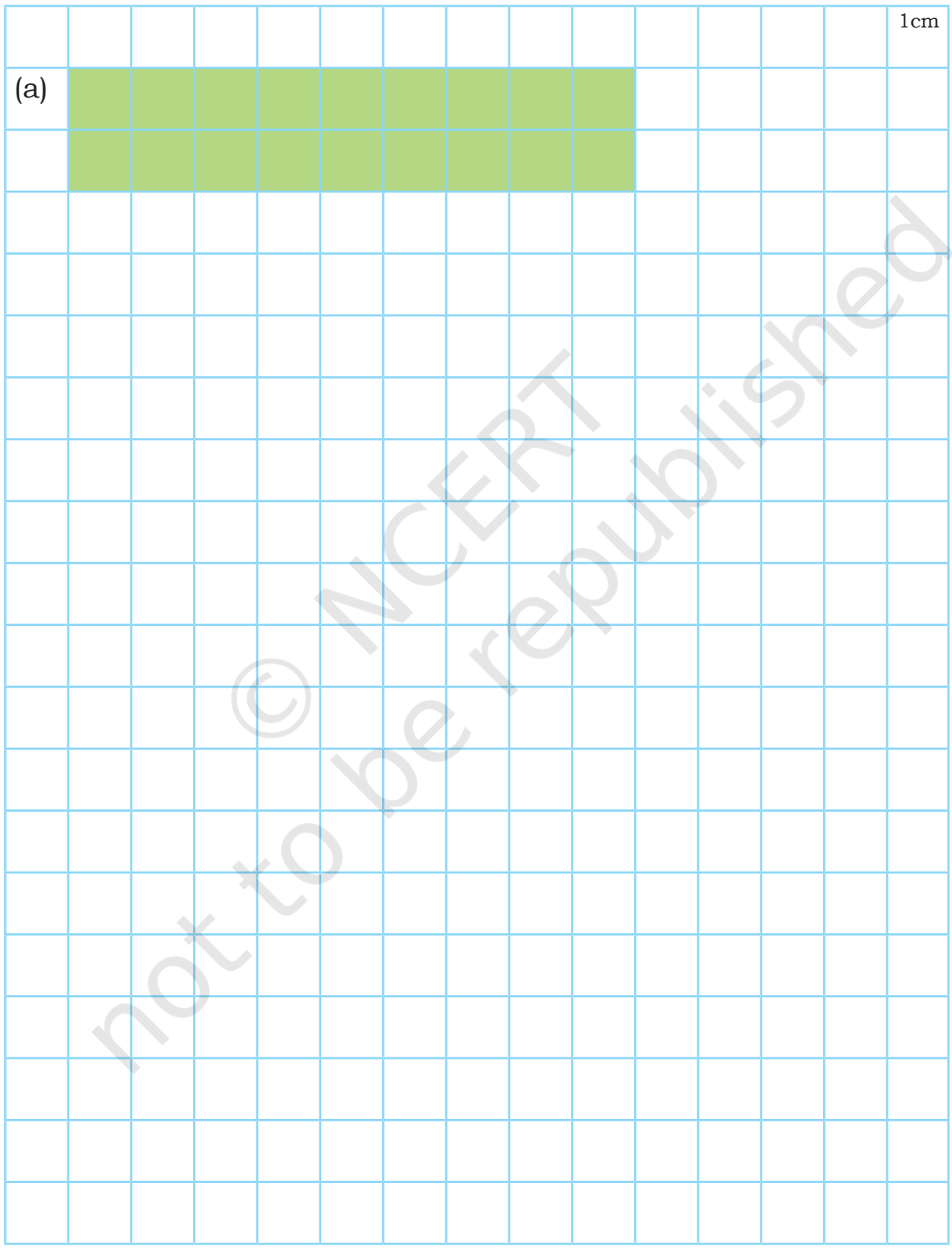
Let Us Do

1. Draw different shapes having the same area as the given shape. Write the perimeter of each shape. What do you notice? Discuss.



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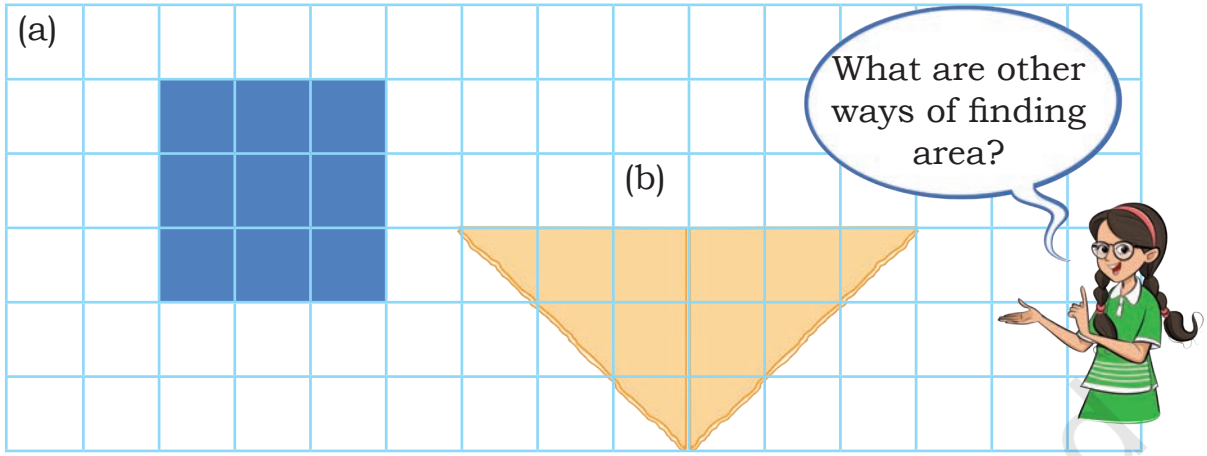
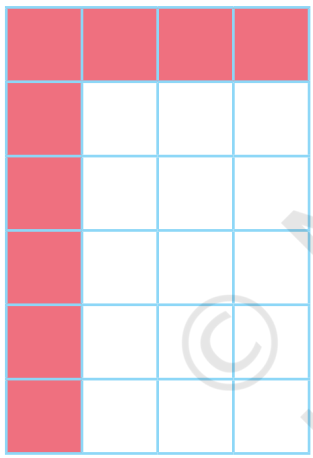
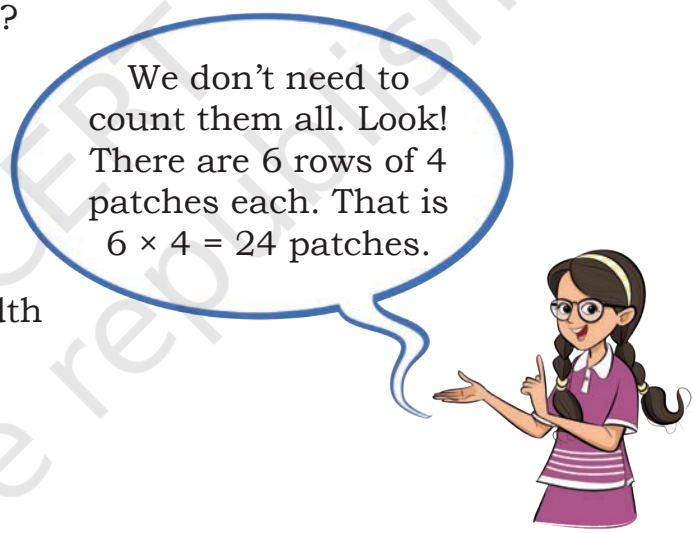
2. Is the area of shape (a) less than the area of shape (b) given below? Discuss.



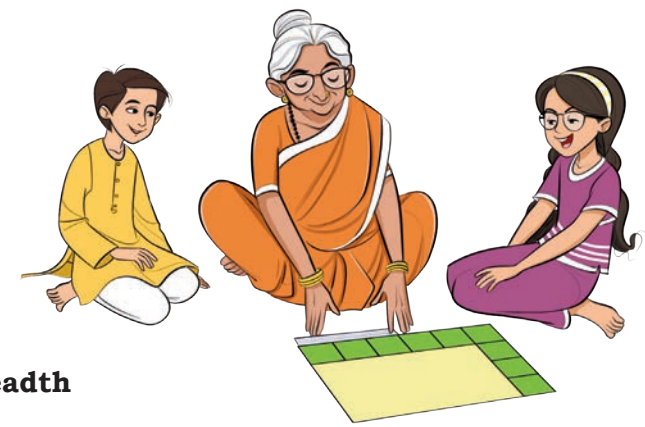
Preetha and Adrit's grandmother is making another square patchwork. She arranges the patches as shown below. Can you guess how many patches she will need? How did you find it?





Did you notice that 6 is the length of one side and 4 is the length of the non-equal side of the rectangle?

Go back to the previous examples and check whether the product of the length and the breadth of the rectangles is the same as the area you had calculated by counting.



Area of Rectangle	**= Length × Breadth**
Area of square patch work	= 6 cm × 4 cm
	= 24 square cm

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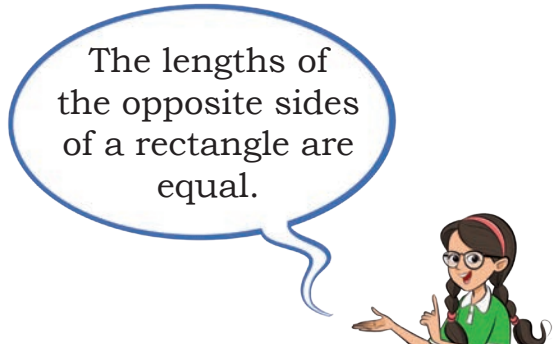
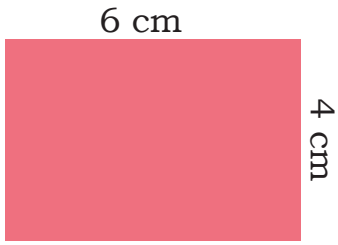
Similarly, we can also find the perimeter of the rectangular shape.

Perimeter = Length + Length + Breadth + Breadth

= 2 × Length + 2 × Breadth



What will happen if all the sides of a rectangle are equal, that is, the case of square?



Let us think about a square whose sides are 5 units long.

Area of Square	**= Length × Length**
Area	= 5 × 5
	= 25 square cm
Perimeter of Square	= Length + Length + Length + Length
	= 4 × Length
	= 4 × 5
	= 20 cm

Let Us Do

1. Find the area of your classroom floor in square meters. Take the help of your teacher to measure the length and breadth of the floor. What is the perimeter of the classroom floor?

Note for Teachers: Instead of counting each square, see that rectangles can be tiled by a row-column arrangement of unit squares. To find the area, they can simply multiply the number of rows by numbers of columns. This will also build an understanding of area as a model for multiplication.

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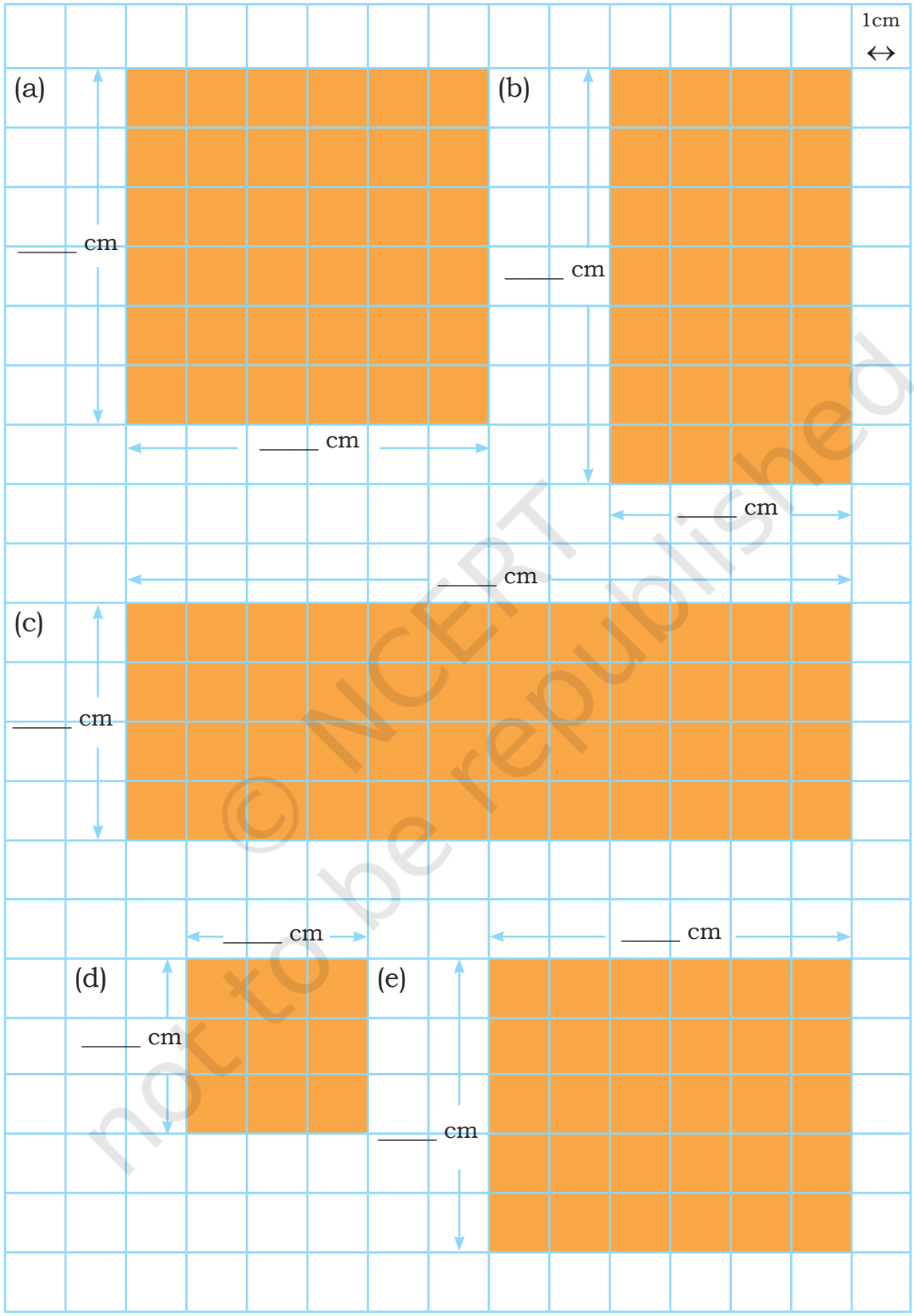
2. Find the area and perimeter of the following shapes.



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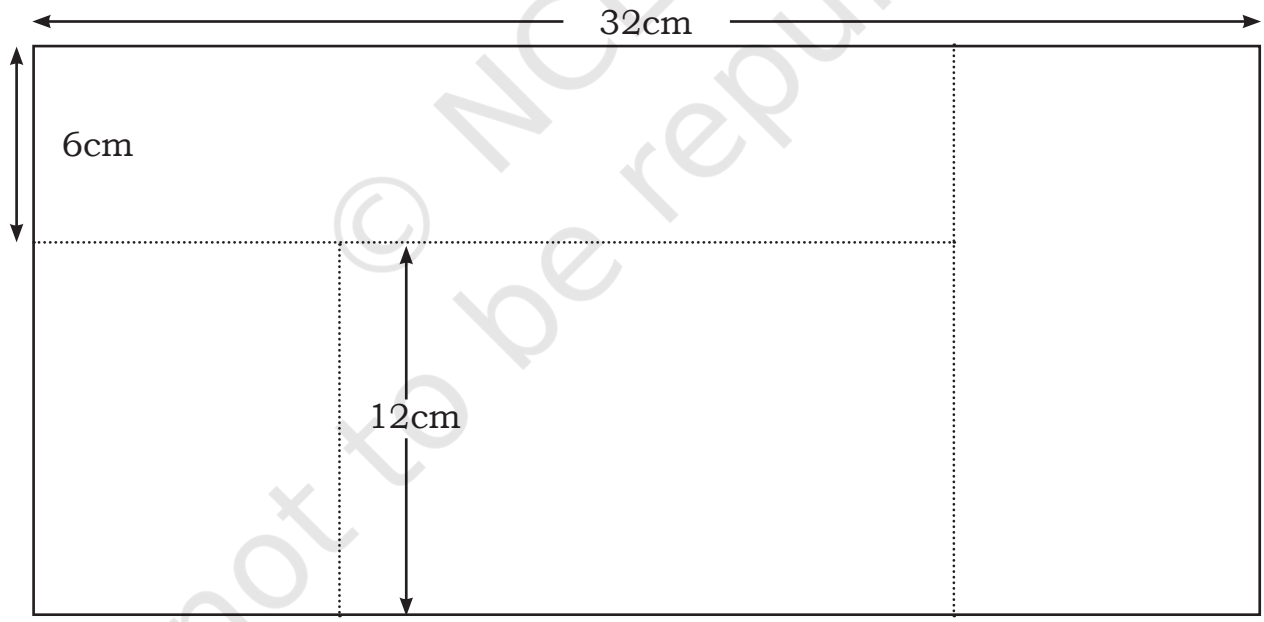
3. Find the area and perimeter of the following objects. Use a scale or measuring tape to find the length and the breadth of each of the objects.

S. No.	Name of the objects	Area	Perimeter
1.	Cover of the Notebook		
2.	Newspaper		
3.	Blackboard		
4.	Ludo board		
5.			
6.			

4. Find the area of a rectangular field whose length is 42 m and breadth is 34 m.
5. The area of a rectangular garden is 64 square m and its length is 16 m. What is its breadth?
6. Find the area of the following figure with the dimensions as marked in the figure.



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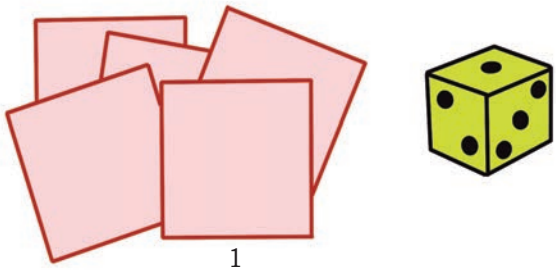
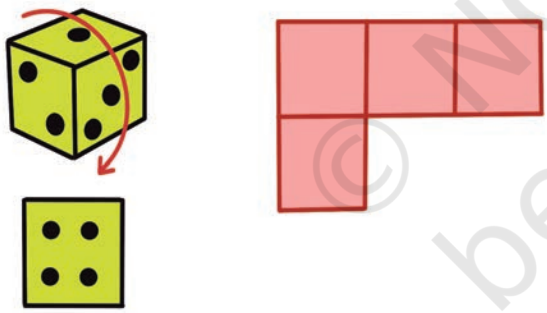
Let Us Play

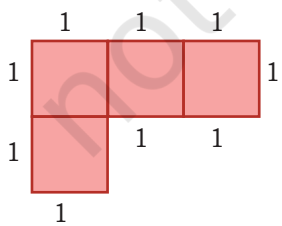
1. Take some square tiles and a die and play the game in pairs.



2. Roll the die and pick the number of tiles equal to the dots on the die. Arrange them to make a shape or figure.

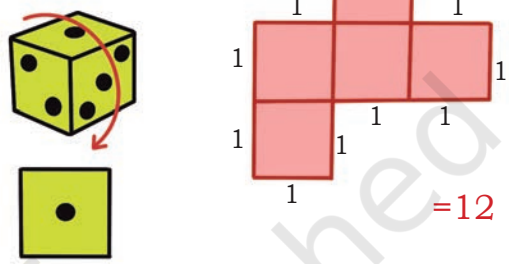


3. Find the perimeter of the tiles.



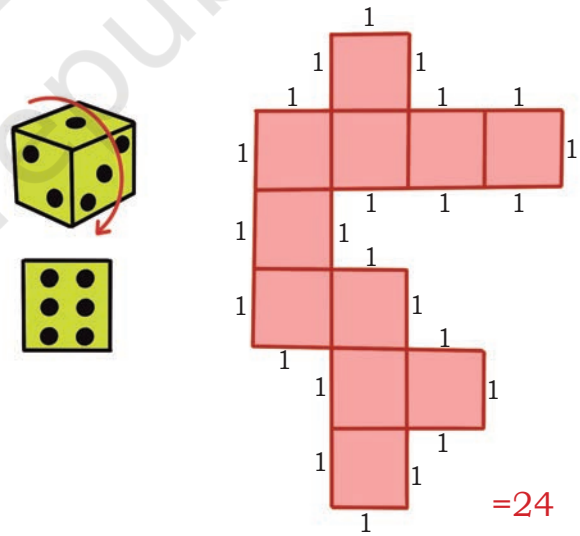
=10

4. Do not move the tiles. The second player can take turn and add tiles to the same tiled figure.



=12

5. Take turns and add tiles to the same figure till the perimeter becomes 24.



=24

The one who makes the perimeter 24 wins the game.

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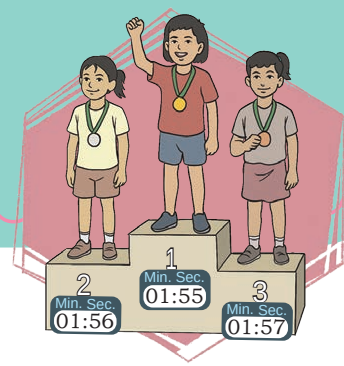
Chapter

12 Racing Seconds

0533CH12



Raghav practices yoga in the morning.

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Let us find out

1. At what time did Raghav start practising Yoga? .....
2. At what time did he finish? .....
3. How much time did he spend practising Yoga? .....
4. Find the time elapsed between the given time periods. Share your strategies.
   (a) 01:15 p.m. to 01:42 p.m.?
   (b) 03:18 p.m. to 08:18 p.m.?
   (c) 09:15 a.m. to 11:30 a.m.?
5. The table below shows the time taken by 3 children to paint a picture.

Name	Time Taken
Raghav	1 hour 20 minutes
Rani	2 hours 10 minutes
Ritu	1 hour 35 minutes

   (a) Who took the longest time?
   (b) Who took the least time?

6. Fill in the blanks by writing the time in the appropriate format.

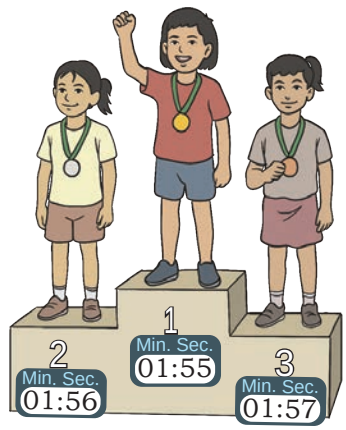
Time in 12-hour fromat	Time in 24-hour fromat
05:30 a.m.	05:30 hours
.....	08:35 hours
11:55 a.m.	..... hours
02:30 p.m.	14:30 hours
05:30 p.m.	..... hours
09:35 p.m.	..... hours

7. Match the following.

Time in 12–hour format	Time in 24–hour format
06:30 a.m.	01:30 hours
08:45 p.m.	23:45 hours
11:45 p.m.	06:30 hours
04:30 a.m.	20:45 hours
07:30 p.m.	04:30 hours
01:30 a.m.	19:30 hours

School Race

Akira, Sunita, and Mary are participating in a 200 m-walking race.



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Do you notice the use of a new unit 'seconds' in the picture?

1 min = 60 seconds

In situations like a race, ***'seconds'*** help us observe small differences in time taken by participants. Each participant took 1 minute but how much more? Identify the child who won the race. How much time did the child take?

Let Us Do

Estimate whether you would take seconds or minutes to complete the following activities. Tick the appropriate cell.

Activity	Seconds	Minutes
Blinking of eyes		
Switching on and switching off the lights		
Counting from 1–20		
Filling a glass from the tap		
Melting of an ice-cube		
Making a phone call		
Sitting down on the floor		
Drinking a glass of water		
Snapping fingers		
Washing hands		

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Note for the Teachers: Let the learners observe and discuss who stood first, who stood second, and who stood third and why. Help them understand the difference between minutes and seconds and seconds as a unit which adds precision in measuring short time duration. Get the learners to observe that 60 movements of the seconds hand leads to a shift in the minute hand.

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List events other than the ones listed above that you can do or that can happen in less than a minute or in a few seconds.

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

Estimate and verify how many of these you can do in a minute.

Activity	Estimated Number	Actual Number
Number of balloons blown		
Number of push-ups		
Number of breaths		
Number of hops on one leg		

Let Us Find

1. Find out the number of times you can skip the rope in 10 seconds.
2. How long does it take you to write the word **FRIEND**?
3. How long does it take you to run 100m?

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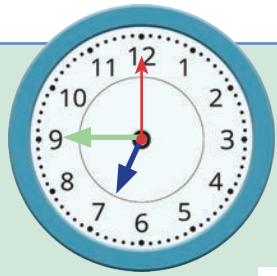
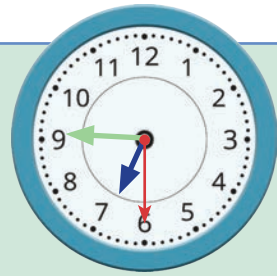
Let Us Do

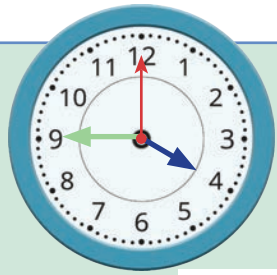
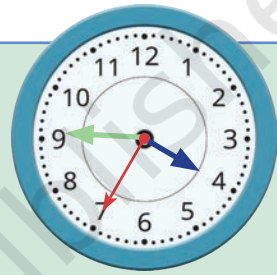
Observe the clocks and fill in the blanks.

1

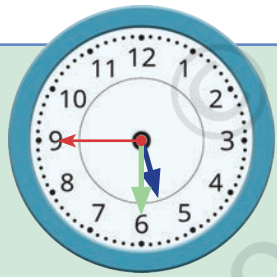
Rani took _____ sec. to get out of her bed.

2

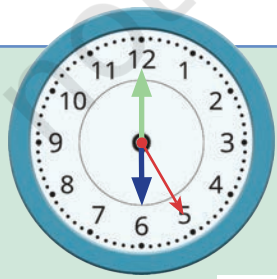
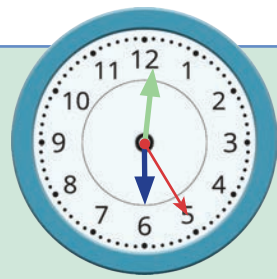
Raghav took _____ sec. to move from his room to the kitchen.

3



Ritu took _____ sec. to pick up a piece of paper from the floor.

4

Raghu took _____ sec. to wash his spoon and plate.

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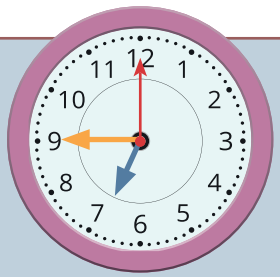
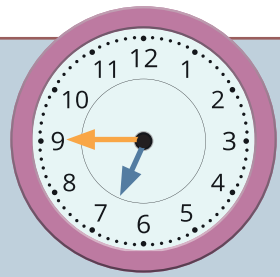
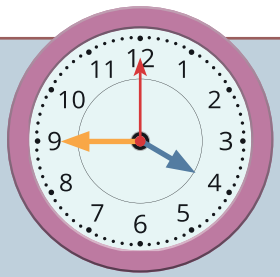
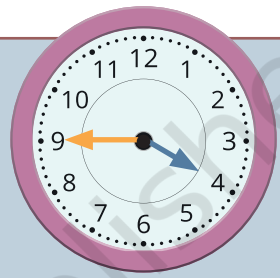
Draw the missing seconds hand on the clocks on the right side.

1

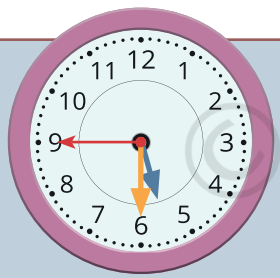
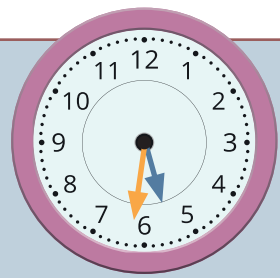
Raghu took **20 sec.** to read a sentence in his book.

2

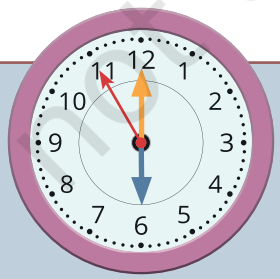
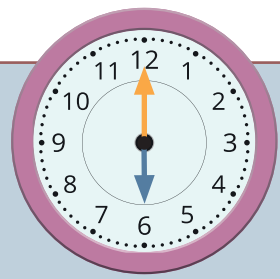
Rani took **30 sec.** to color a rectangle.

3

Raghav took **60 sec.** to move from his home to the garden.

4

Ritu took **40 sec.** to wash a plate.

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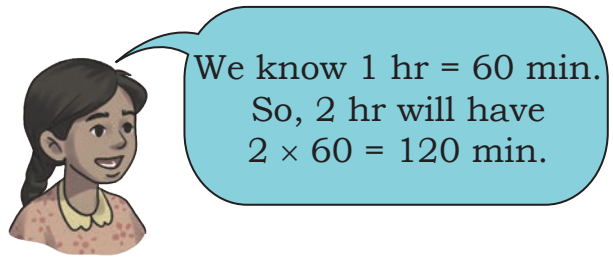
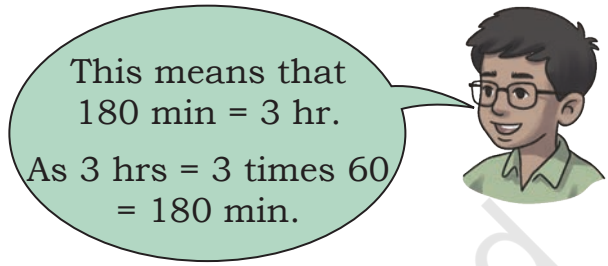
Conversion of Hours to Minutes

Zainab and Remo were converting time from hours to minutes and vice-versa.

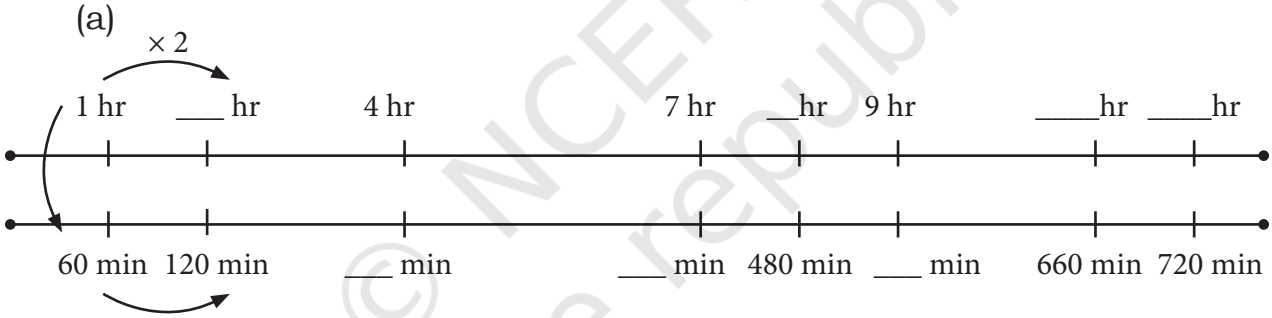




Let Us Do

1. Use the double number line below to complete the conversions.

(a)



(b) Do as instructed. You can use the above double number line for the following conversions.

(i) 1 hours 10 minutes = _____ minutes
(ii) 2 hours 45 minutes = _____ minutes
(iii) 3 hours 15 minutes = _____ minutes
(iv) 4 hours 20 minutes = _____ minutes
(v) 75 minutes = ____ hour ____ minutes
(vi) 150 minutes = ____ hours ____ minutes
(vii) 220 minutes = ____ hours ____ minutes
(viii) 390 minutes = ____ hours ____ minutes

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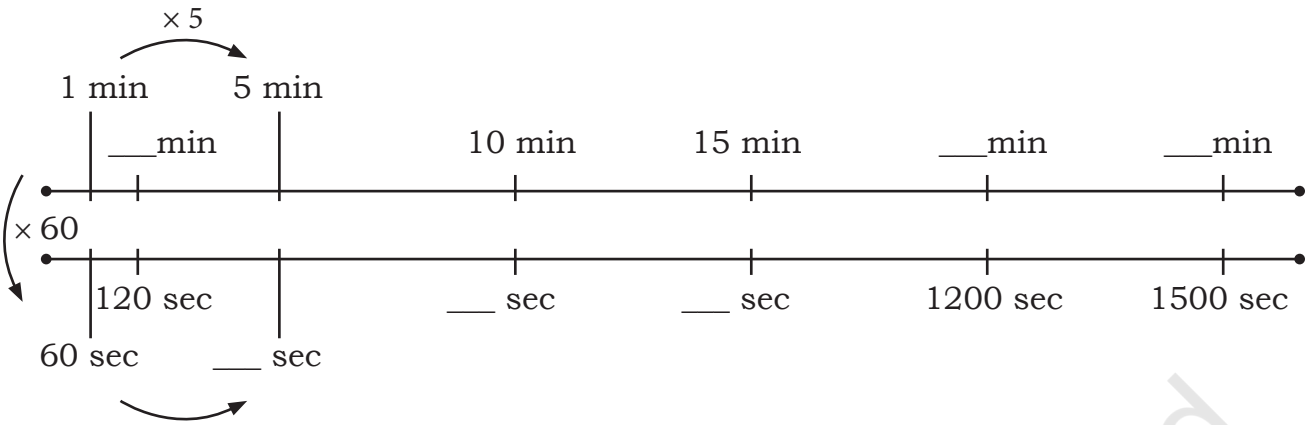
(c) Fill in the blanks in the double number line to complete the conversions.



(i) 320 sec = ____ min ____ sec

(ii) 225 sec = ____ min ____ sec

(iii) 700 sec = ____ min ____ sec

(iv) 1,000 sec = ____ min ____ sec

(v) 10 min 13 sec = ____ sec

(vi) 4 min 8 sec = ____ sec

(vii) 15 min 40 sec = ____ sec

2. Raghav studies Mathematics, English, Hindi, and The World Around Us subjects. He took 50 minutes to study each of the subjects. Find the total time taken in hours and minutes. Share your strategies with your class.

3. Raghu left his house at 08:00 hours and arrived at his *Nana ji's* house at 09:05 hours. How long did he take to reach his house?

08:00 hours to 09:00 hours is 1 hour.
So, Raghu took 1 hour 5 minutes to reach his *Nana ji's* house.

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4. Jyoti went to play at 06:15 PM. She came back after 1 hour 45 minutes. At what time did she reach home?

5. Ragini took 1 hour 10 minutes to do her homework. She finished it at 09:40 PM. What time did she start?

6. A group of children left for a picnic at 08:30 AM. They returned after 4 hours and 10 minutes. At what time did they return?

7. Raji started her homework at 06:00 PM. She finished her homework in 1 hour 30 minutes. At what time did she finish?

8. Alya goes out to play at 05:30 PM and comes back after 1 hour 10 minutes. At what time does she come back?

9. If the lunch break of a school starts at 12:30 PM and ends in 35 minutes, what time will lunch end?

10. It is 08:35 PM right now. What time will it be after 8 hours and 25 minutes?

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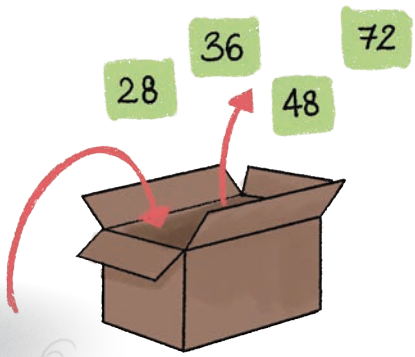
Note for the Teachers: Encourage learners to solve these problems orally and not by aligning them in columns and using algorithms.

Chapter

13 Animal Jumps

Find the hidden numbers.



Numbers put in this box get multiplied by a number and come out.

(a) Can you guess the multiplier if you see the 4 numbers coming out of the box?

(b) Is there more than one possible multiplier?

(c) What numbers might have been put inside the box?

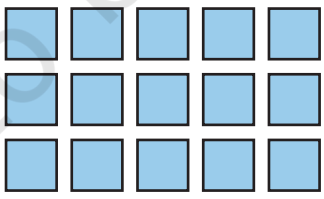
Share your thoughts in the class.

You can also play this game with your friends.

The multipliers 1, 2, and 4 that you found above are the **factors** of the numbers that have come out of the box, that is, 28, 36, 48, and 72. In fact, these are the common factors of all the numbers. The numbers 28, 36, 48, and 72 are **multiples** of 1, 2 and 4.

The product of two or more factors gives a multiple.

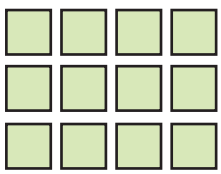
A number, when arranged in an array, shows the factors of that number. Are there other numbers that are factors of 15? Try to make other arrays for the number 15.



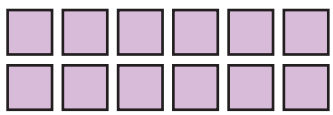
3 × 5 = 15

Factors | Multiple

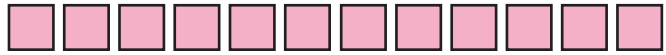
Let us make arrays for the number 12.



3 × 4 = 12



2 × 6 = 12



1 × 12 = 12

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1, 2, 3, 4, 6, and 12 are all factors of 12. Each of the numbers can divide 12 completely. 12 is a multiple of these numbers.

Do you see why 12 is a multiple of 1, 2, 3, 4, 6, and 12?

$2 \times \_\_\_\_ = 12$ $\quad$ $3 \times \_\_\_\_ = 12$

$12 \times \_\_\_\_ = 12$ $\quad$ $1 \times \_\_\_\_ = 12$

The number itself is always a multiple of itself.

Let Us Do

Make different arrays for the following numbers. Identify the factors in each case.

(a) 10 (d) 20 (g) 37

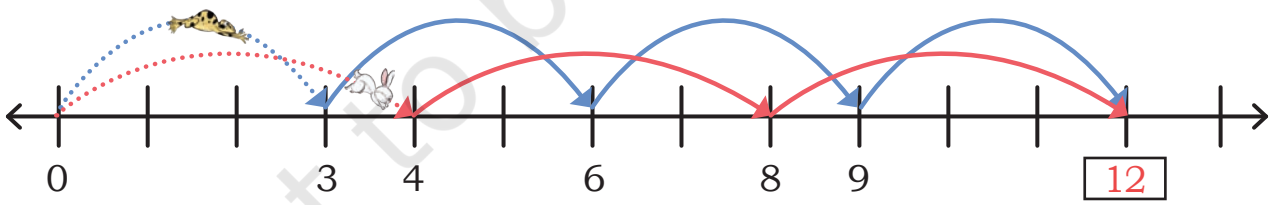
(b) 14 (e) 25 (h) 46

(c) 13 (f) 32 (i) 54

Numbers like 13 and 37 are called prime numbers. Why?

Animal Jumps

A rabbit takes a jump of 4 each time. A frog takes a jump of 3 each time. Use the number line to figure out the numbers they will both touch. If the rabbit and the frog start from 0, the numbers both of them will touch are called the **common multiples** of 3 and 4.



12 is the first common multiple of 3 and 4. What are some other common multiples of 3 and 4? You can continue the number line or take help from the times tables of 3 and 4.

What do you notice about the common multiples of 3 and 4? Discuss in class.

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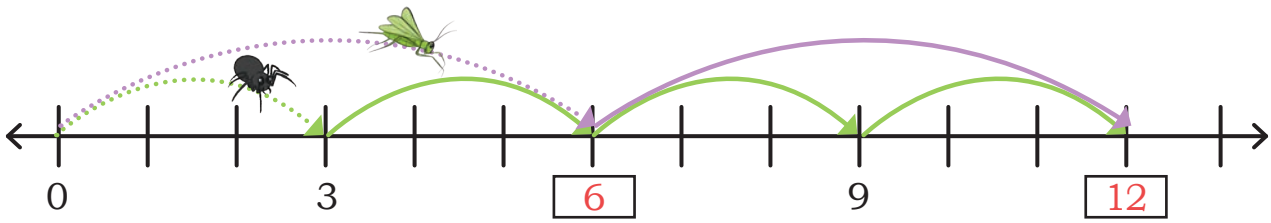
A spider takes a jump of 3 every time. A grasshopper takes a jump of 6 each time. Use the number line to find the common multiples of 3 and 6.



6 and 12 are two common multiples of 3 and 6. You can continue the pattern to find more common multiples. What do you notice about the common multiples of 3 and 6? Discuss.

Let us write the multiples of two numbers— 4 and 6.

Multiples of 4— 4, 8, 12, 16, ...

Multiple of 6— 6, 12, 18, ...

12 and 24 are two of the common multiples of 4 and 6. List a few more.

Let Us Do

1. Find 5 common multiples of the following pairs of numbers.

(a) 2 and 3	(d) 3 and 9	(f) 8 and 12
(b) 5 and 8	(e) 5 and 10	(g) 6 and 8
(c) 2 and 4	(f) 9 and 12	(h) 6 and 9

What do you notice about the common multiples of different pairs of numbers? Discuss in class.

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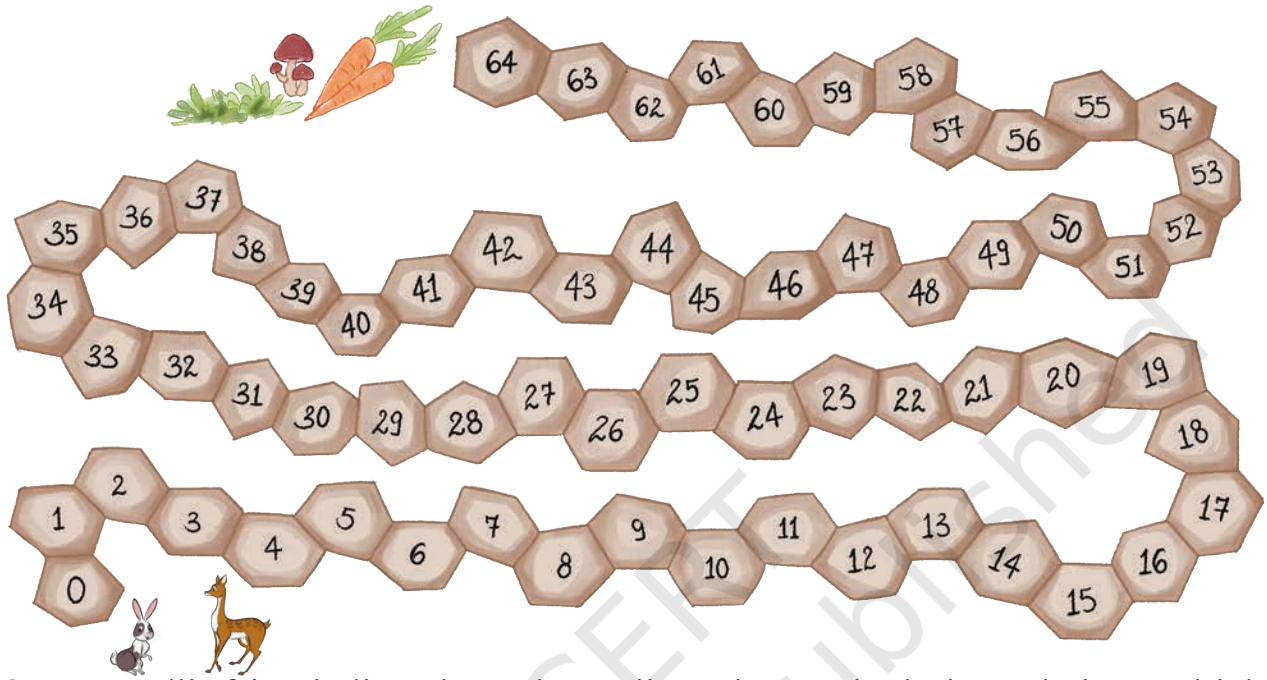
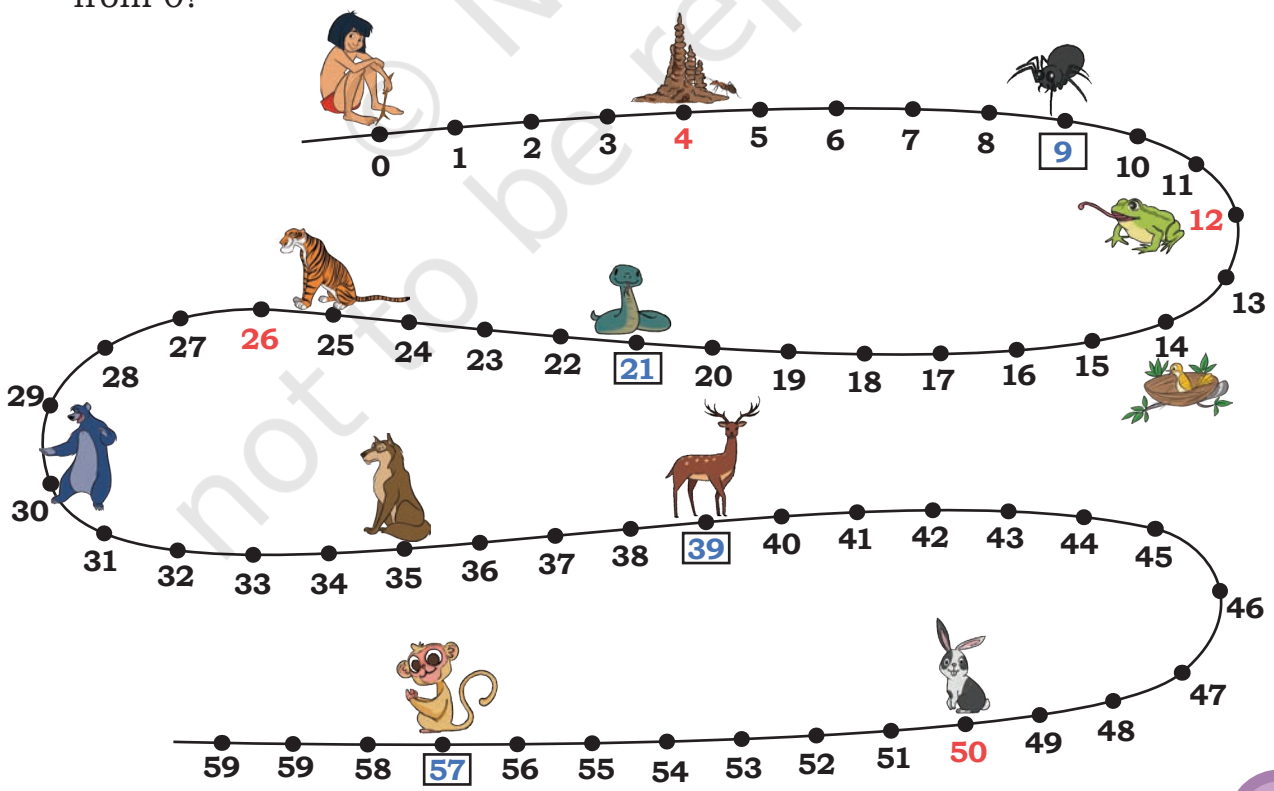
2. Food is available at the end of a cobbled road. Robby, the rabbit, takes a jump of 4 each time. Deeku, the deer, takes a jump of 6 each time. They both start at 0. Will both Robby and Deeku reach the food? Who will reach first? How do you know? Explain your answer.



3. Mowgli's friends live along the trail on the marked places below. Which of his friends will he be able to visit, if he jumps by 2 steps starting from 0?



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Did Mowgli meet the ant, frog, bird and the rabbit? Notice their positions— 4, 12, 14, and 50. 2 is a common factor of these numbers.

Which of his friends will he be able to meet if he jumps by 3 steps?

3 is a common factor of the numbers 9, 21, 39, and 57.

Which numbers will he touch if he jumps by 5 steps?

_____.

5 is a common factor of the numbers _____.

Which numbers will he touch if he jumps by 10 steps?

_____.

10 is a common factor of the numbers _____.

A **common factor** of two or more numbers exactly divides each the numbers.

4. Let us find some common factors of the numbers 24 and 36. Note that all jumps in the following questions start from 0.

   (a) Can we jump by 2 steps at a time to reach both 24 and 36? Yes/No. 2 is/is not a common factor of 24 and 36.

   (b) Can we jump by 3 steps at a time to reach both 24 and 36? Yes/No. 3 is/is not a common factor of 24 and 36.

   (c) Can we jump by 4 steps at a time to reach both 24 and 36? Yes/No. 4 is/is not a common factor of 24 and 36.

   (d) What other jumps can we take to reach both 24 and 36?

   (e) How many common factors can you find for 24 and 36? List them.

   (f) What about jumping by 1 step each time to reach both 24 and 36?

5. What are the common factors of 12 and 13?

The number itself and 1 are always factors of any number

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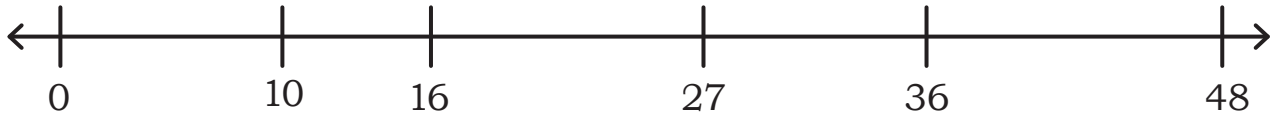
6. Find which of the following numbers can be reached by jumps of 4 steps?



4 is the common factor of the numbers _____.

7. Find the common factors of the following pairs of numbers.

(a) 12 and 16
(b) 8 and 12
(c) 4 and 16
(d) 2 and 9
(e) 3 and 5
(f) 12 and 15
(f) 20 and 5
(g) 9 and 21
(h) 6 and 27

What do you notice about the common factors of different pairs of numbers. Discuss in class.

8. State whether the following statements are true (T) or false (F).

(a) Factors of even numbers must be even.
(b) Multiples of odd numbers cannot be even.
(c) Factors of odd numbers cannot be even.
(d) One of the common multiples of two consecutive numbers is their product.
(e) The only common factor of any two consecutive numbers is 1.
(f) 0 cannot be a factor of any number.

9. Sher Khan, the tiger, goes hunting every 3rd day. Bagheera, the panther, goes hunting every 5th day. If both of them start on the same day, on which days will they be hunting together?

10. (a) In the trail shown earlier, Sher Khan's house is on number 25 and that of Baloo the bear is on number 30. Mowgli wants to meet his friend Baloo the bear but wants to avoid Sher Khan's house. How long (in steps) could each jump be?

(b) What number of jumps (in steps) he could choose so that he can meet both Kaa, the snake, at 21 and Akela, the wolf, at 35?

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11. Sort the following numbers into those that are—

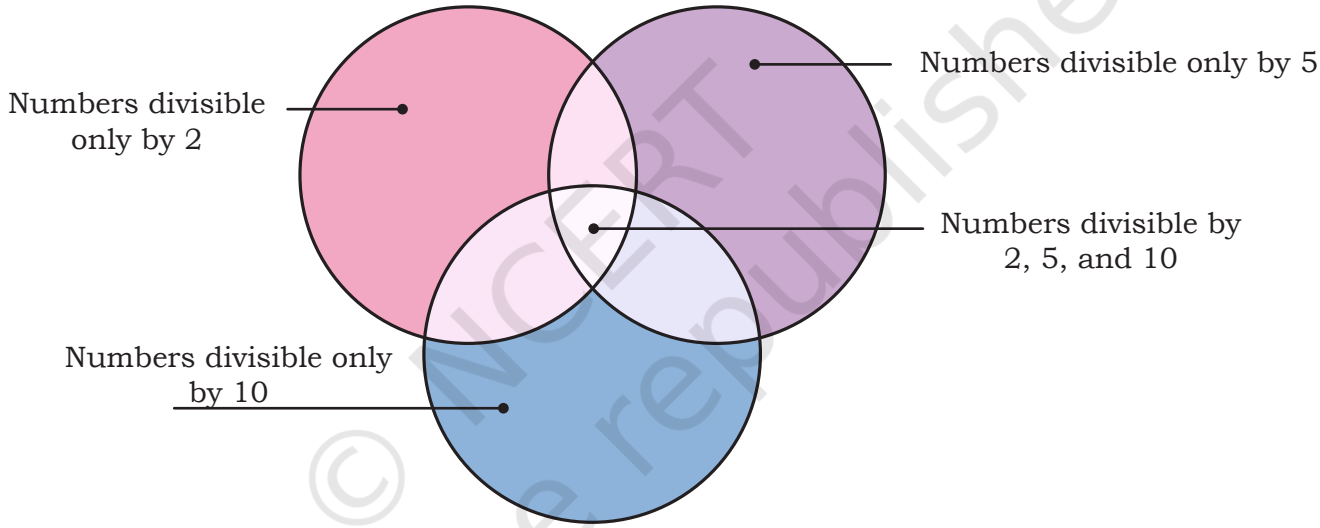
(a) divisible by 2 only

(b) divisible by 5 only

(c) divisible by 10 only

(d) divisible by 2, 5, and 10.

90	22	38	30	75
45	66	78	62	40
84	56	25	95	55



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Chapter 14

Maps And Locations

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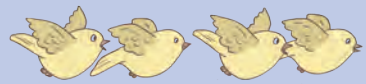
Finding Directions ...

I visited the Bharatpur Bird Sanctuary in Rajasthan and saw an amazing bird called the Siberian Crane!

Wow! Do you know that these birds fly all the way from Siberia, a very cold place, to India?

I wonder how they find their path.

Human beings also keep track of directions. One of the ways we figure out directions is by facing the rising Sun. Let's try!



Four Little Chicks

Four Little Chicks of a bird set out to fly,
Spreading their wings they all flew high.
They flew away from East to West,
flew North to South, without any rest.

As they flew and explored the land,
finally, they returned home, hand in hand.
With their mother, they had so much to share,
Our home is the best, beyond compare!"

Manu is facing the rising Sun.

That direction is _____.

His left hand is pointing in the_____ direction.

His right hand is pointing in the _____ direction.

which way is west?

Note for Teachers: Help the learners in naming the four cardinal directions. Ask the children to figure out the directions by facing the rising sun. Also, discuss with them other ways of finding directions, such as using a compass. To spark curiosity, you may talk about or encourage the learners to find out how birds find their directions during migration.

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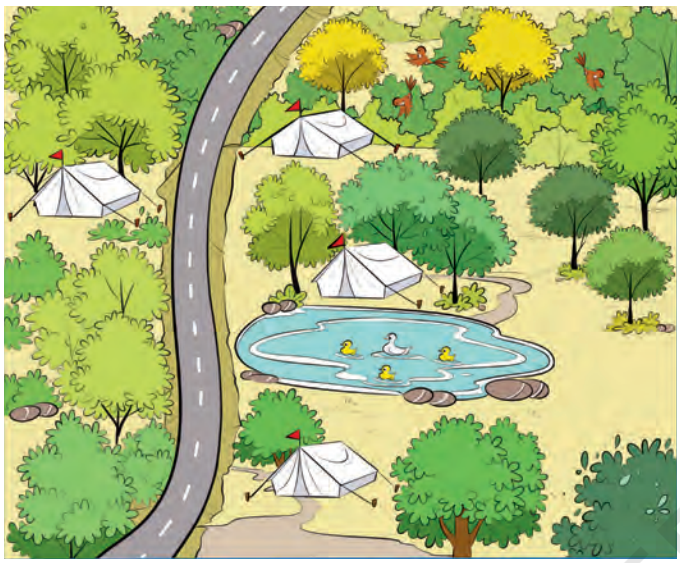
Bird Watching!

Children are at a bird-watching camp. Read the clues and colour the tents in the camp accordingly.



The tent to the west of the road is blue.
The tent closest to the lake is green.
The tent north of the green tent is purple.
The tent south of the lake is yellow.
Now, draw a tent to the east of the lake.

Map of a Room

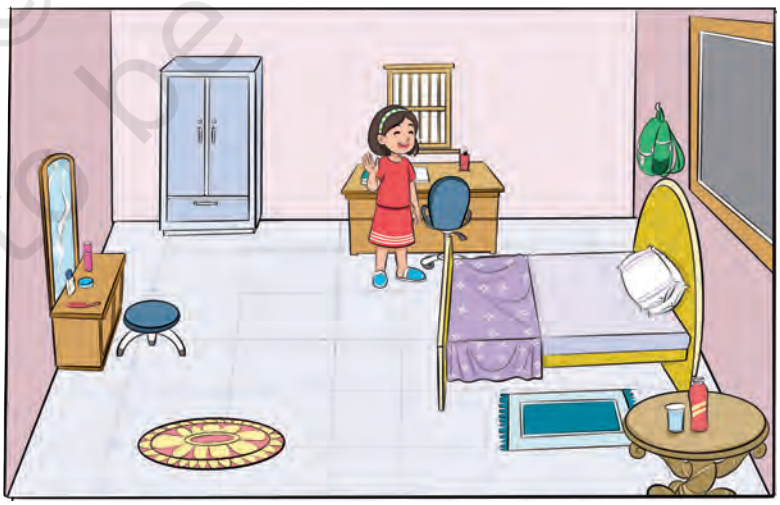
Write the directions of the following in relation to the girl.

Window _____

Bed _____

Cupboard _____

Bedside table _____



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Make a drawing of your room and locate the direction in which different things have been placed in relation to you standing at the centre of the room. Make the direction arrow for your room.

Write the names of the things that are placed in the following directions.

East_____

West_____

North_____

South _____

Zoo Trip

Children! Be ready at your nearby bus stop by 8:00 a.m. The school bus will take you to the Qutb Minar in Delhi. After that, we will visit the zoo by a metro train.

The street map shows the bus route with dotted lines. The bus will pick up children from Stop 1 and Stop 2 marked on the map.

Observe the map carefully and help the children board the bus.

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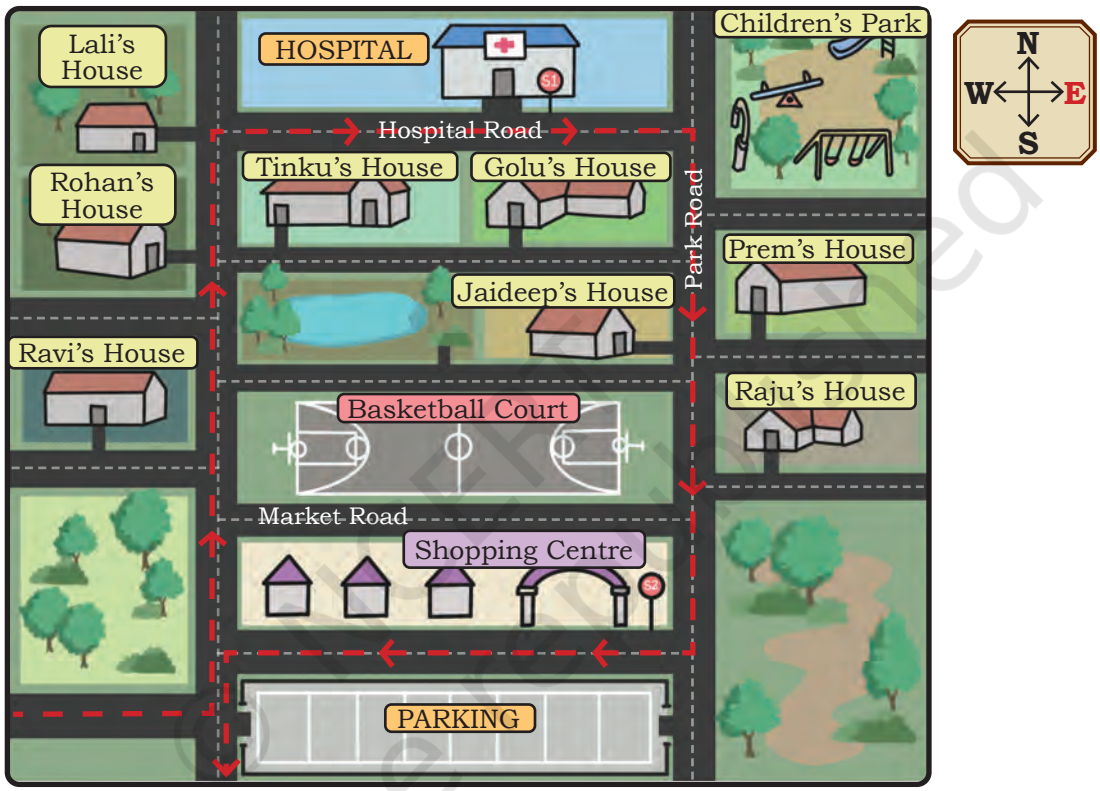
Bus Route

The bus will start from the parking area. It will go north and then it will take a right turn onto _____ Road driving in the _____ direction to reach Stop 1(S1).

To reach Stop 2(S2), it will turn _____ (right/left) onto _____ Road driving in the _____ direction.



(a) Whose houses are situated to the east of Jaideep's house?_____

(b) Mark the route from Ravi's house to the children's park.

(c) Which stop is closer to Lali's house? _____

(d) Golu is running late. Trace the route to help him reach the nearest bus stop.

(e) In which direction would Prem have to move to reach Stop 2?

Note for Teachers: Encourage the learners to read the street map. Ask them to discuss the distances and directions on the map. Encourage the learners to ask questions by looking at the map.

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Delhi Metro Train Stations

Children will get off the bus at the Qutb Minar metro station. To reach the zoo, they need to get off the metro at the Supreme Court metro station.

Here is the metro map for your reference.

Read the key to the symbols and identify them on the map.

What do the different coloured lines represent?

Mark the Qutb Minar station on the Yellow Line and the Supreme Court station on the Blue Line.

Metro Map

Study the map carefully and answer the questions that follow.

Note for Teachers: Encourage the learners to observe the metro map carefully. Let them understand what different symbols mean on the map. Discuss with them that the coloured lines indicate different metro routes, making it easier for passengers to identify and navigate the routes. Let the learners work in groups to answer the questions.

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(a) Look at the metro map and trace different routes from the Qutb Minar metro station to the Supreme Court metro station.

(b) Lali says, "We can take the Yellow Line and change the metro at Hauz Khas to take the Magenta Line."

If the children follow Lali's suggestion, at which station(s) do they need to change the metro line again to reach the Supreme Court metro station?

(c) Which route has the least number of stations between Qutb Minar and Supreme Court?

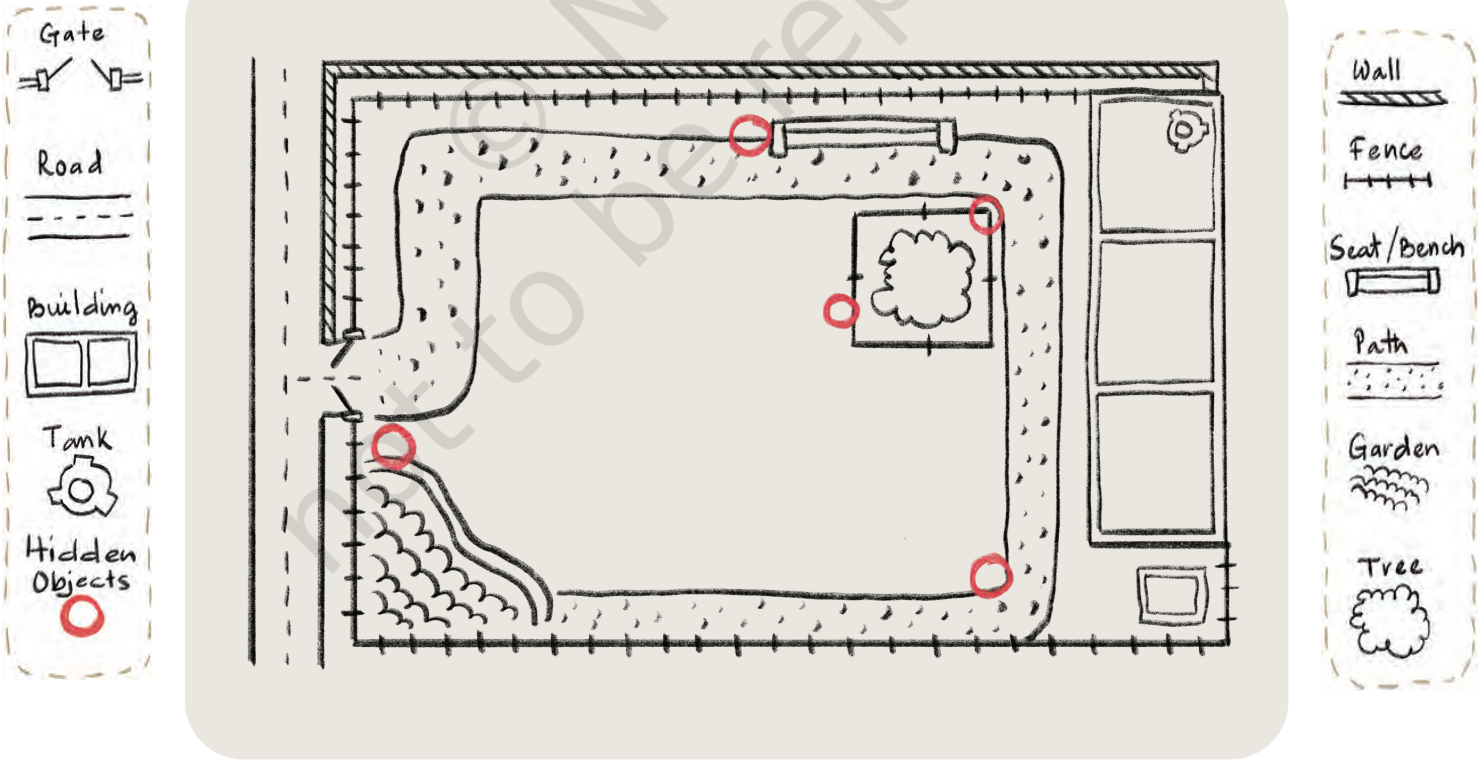
(d) Which metro route(s), do you think, is/are the best way to reach the zoo from Qutb Minar? _____

Let Us Do

Make a map showing the different places in your school. Make a key for the symbols used in the map. Hide some objects in these places.

Mark the positions where things are hidden with red dots or flags. Now, challenge your friends to find the hidden things by reading the map.

A sample map and its key are given below.



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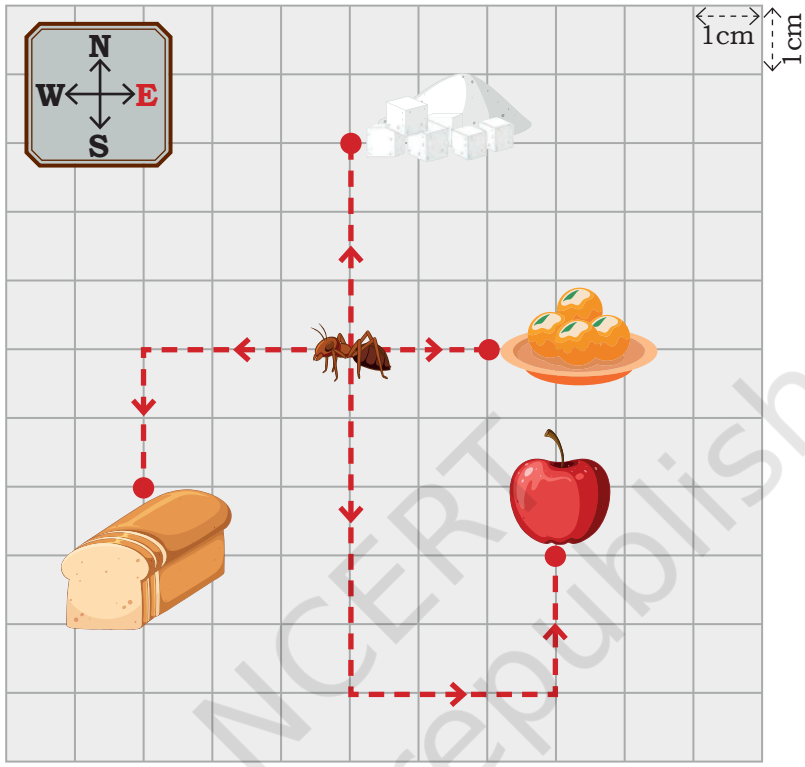
Anthill in the Zoo

To collect food, the ant can only crawl along the dotted lines on the grid. The arrows show the direction in which the ant can move.



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Fill in the blanks below with the distances and the directions in which the ant must move from its starting position.

(a) To get to the laddoos, the ant has to crawl 2 cm towards the east.

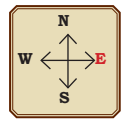
(b) To get to the sugar, the ant has to crawl ____cm in the _____direction.

(c) To get to the bread, the ant has to crawl ____cm in the _____ direction; then ____cm in the _____direction.

(d) To get to the apple, the ant needs to crawl _____cm towards _____, and then ____cm towards _____, and finally ___cm towards_____.

Identify other routes to reach the point where apple is located. Which one is the shortest?

Locating the Animals in the Zoological Park (Zoo)

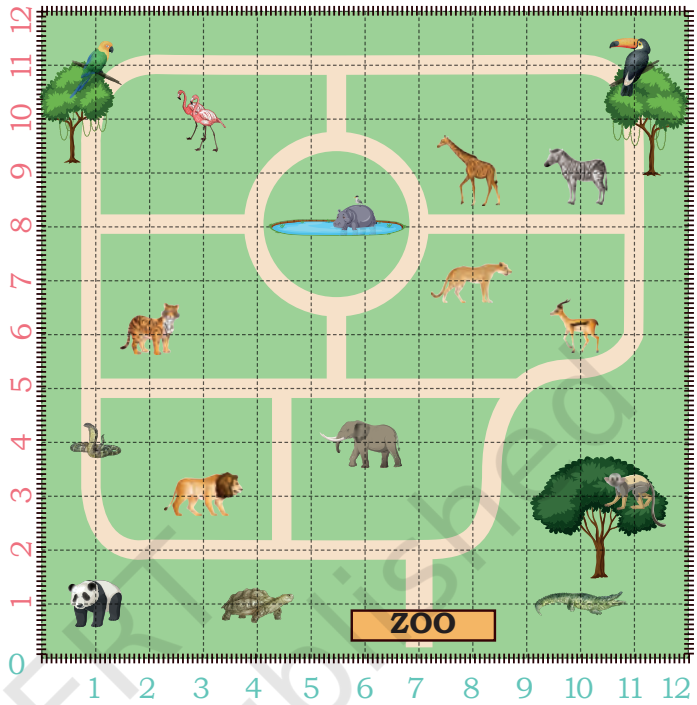


Children observe a map of the zoo drawn on a grid. Each vertical line (column) and horizontal line (row) is marked with a number.

To reach the Panda, we will start from zero. Move one step horizontally east and reach the first column.

Move up (vertically) one step north and reach the first row.

The panda is where the first row and the first column meet.



First move horizontally from 0 and then vertically.

We write the meeting point of the first row and the first column as (1,1).

To reach the tortoise, move _____ steps towards east and reach the _____ column.

Then move _____ step(s) _____ and reach the first _____.

The location of the tortoise is (4,1). What is at (1,4)?

Answer the following questions now—

1. Locate the animal at the following positions on the map.

   (a) (11,11) _____ (c) (6,4) _____ (e) (11,3) _____

   (b) (2,6) _____ (d) (3,10) _____ (f) (10,9) _____

2. Write the position of the following animals on the map.

   (a) Lion _____ (c) Tortoise _____ (e) Panda _____

   (b) Elephant ____ (d) Deer _____ (f) Crocodile _____

3. Place dots of different colours on the following positions.

   (a) (8,3) (Red) (c) (7,3) (Blue) (e) (8,6) (Black)

   (b) (2,9) (Green) (d) (3,8 (Orange) (f) (6, 6) (Pink)

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Chapter 15

Data Through Pictures

Child TV Reporter

Samaira and Kabir decided to act like reporters and collect information from their friends.

They collected data from 35 friends and recorded it in a notebook as shown below.

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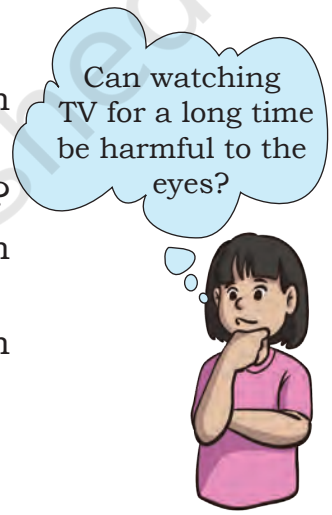
No. of Hours Spent Watching TV	No. of Children
$\frac{1}{2}$ hour	
1 hour	
$1\frac{1}{2}$ hour	
2 hours	
More than 2 hours	

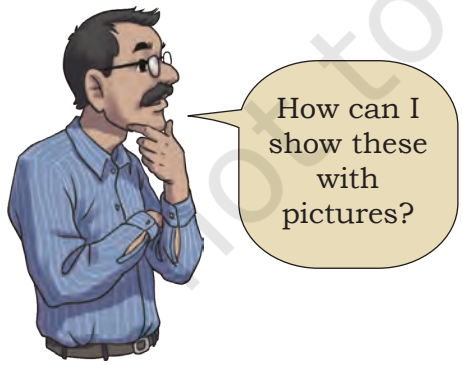
Look at the table and answer the following questions.

1. How many children watch TV for more than half an hour?
2. How many children watch TV for less than two hours?
3. The number of children who watch TV for more than two hours is _____.
4. More children watch TV for two hours than half an hour. (True/False)



Stock-Taking in a Shop

Joseph Uncle takes stock of the play items (toys, board games, and sports items) in his store a week before the summer break. He tries to record the items in his shop using a pictograph.



He notices that there are too many items of each kind in his shop and it is not easy to make a picture for every item.

Suggest some ways to him.

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Dipesh, one of his helpers, suggested using one picture (icon) for every 5 items of each kind.

His pictograph is shown below.

Name of the Item	Number of Items
Toys	
Board games	
Sports items	

Dipesh used a scale while recording the items in the pictograph. A scale helps record a large number of things using fewer icons.

Now, answer the following questions based on the above pictograph.

(1) How many toys does Joseph Uncle have? _____

(2) How many board games does Joseph Uncle have? _____

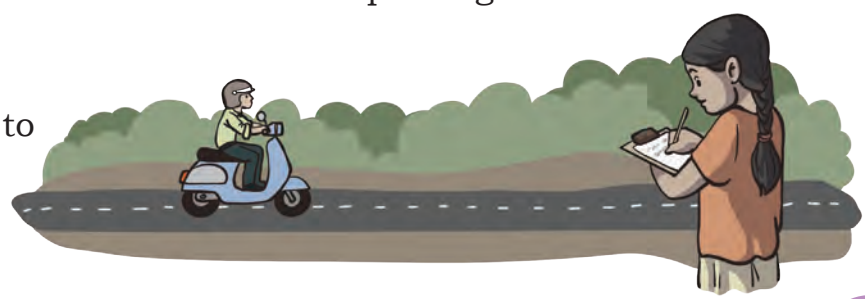
(3) How many total play items does Joseph Uncle have? _____

Is there any other scale that you can use to make the pictograph? Choose your scale and show the same data using a pictograph in your notebook.

Two-wheelers on the Road

Deepti noted down the number of two-wheelers passing her house in one hour on three different days.

She used one icon (🛵) to show 3 two-wheelers.



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Day	Number of Two-wheelers = 3 two-wheelers
Monday	
Wednesday	
Friday	

Observe the pictograph and answer the following questions.

1. Which day had the most two-wheelers passing her house? _____
2. How many total two-wheelers did she record over three days? _____
3. How many fewer two-wheelers were seen on Wednesday than on Monday? _____
4. How many more two-wheelers were seen on Friday than on Wednesday? _____
5. Choose any other scale and represent the same data using a pictograph in your notebook.

Recording a Day

One day Raman and Sheela decided to record how they spent their day.

Raman recorded his daily routine in the table below.

Activites	No. of Hours (▢ =1 hour)
Time spent sleeping	▢▢▢▢▢▢▢▢▢
Time in school	▢▢▢▢▢▢
Time spent studying	▢▢
Time spent eating and playing	▢▢▢▢▢▢
Other activities	▢

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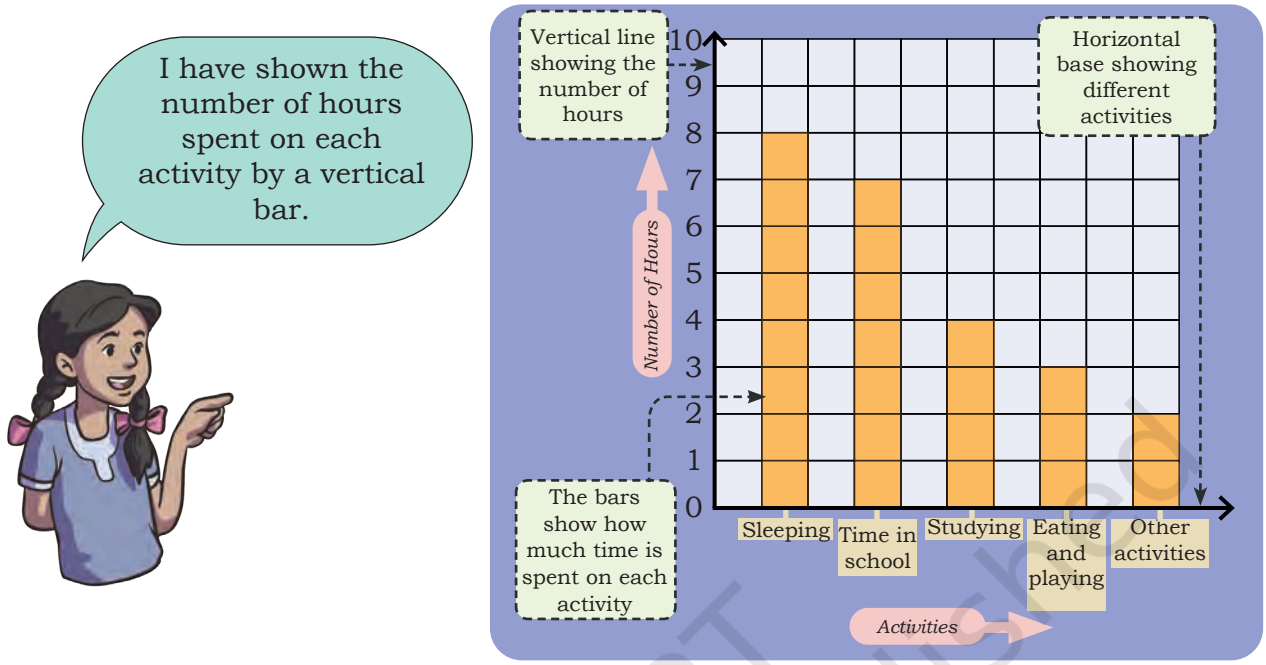
Sheela recorded her routine in the following manner.



How is Sheela's recording different from Raman's recording? Discuss in class.

Sheela's way of recording the data is called a **bar graph**.

Observe Raman's and Sheela's routines and answer the following questions.

1. Whose daily routine shows more time spent on sleeping? _____
2. Who spends more hours in the school? _____
3. How many more hours does Sheela spend studying compared to Raman? _____
4. Is there any activity on which they spend the same amount of time? If yes, name the activity _____
5. Based on their data, whose routine do you think is more balanced? Why? _____

Day in My Life

Record your daily routine (24 hours) in hours and minutes, as necessary. Note the time spent on activities like sleeping, studying, playing, eating, and others.

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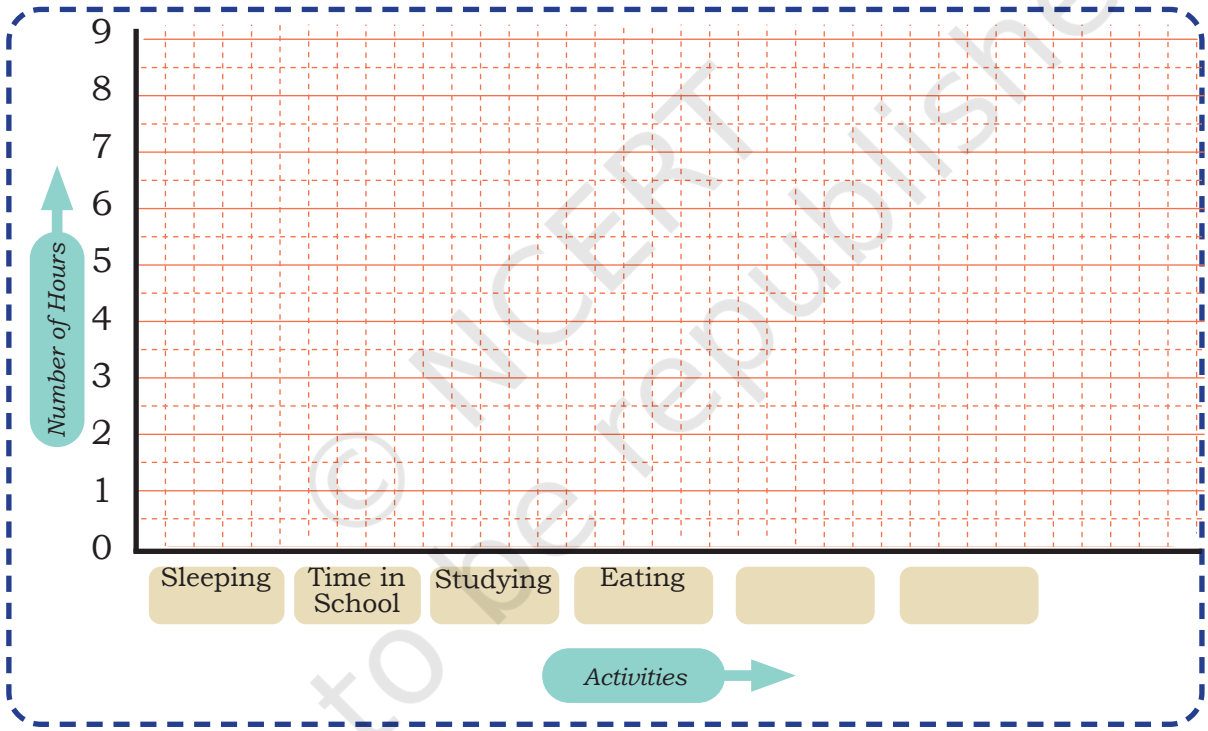
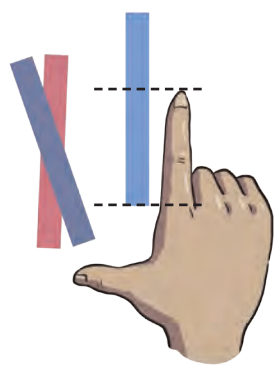
Activity	No. of Hours
Sleeping	
Time in school	
Studying	
Eating	

Make a bar graph of the time you spend on different activities in the space given below.



Whose Index Finger is Longer?



Cut long paper strips from waste paper. Give one strip (each of the same width) to each of your friends. Now, put the paper strip on your index finger and tear off the extra strip extending above your fingers.

Paste these paper strips along the horizontal line in the given bar graph.

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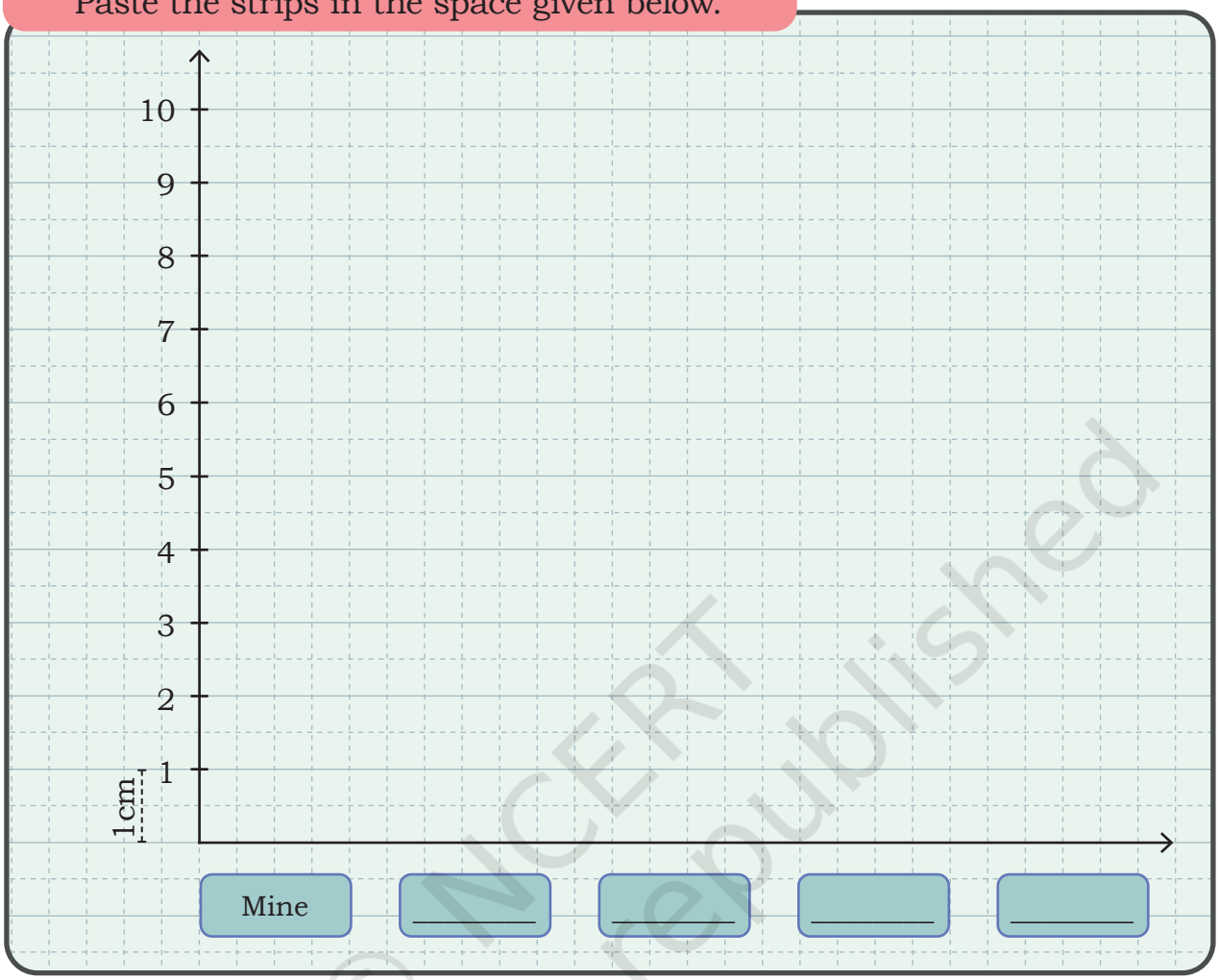
Paste the strips in the space given below.



Write the answers to the following questions based on your graph.

1. Whose index finger is the longest? _____ .
2. The length of the longest index finger is _____ cm.
3. The smallest index finger is _____ cm long.
4. It belongs to _____.

Food Wastage in the School Canteen

Rani stays in a residential school. Her school's dining hall displays the amount of food wasted and the number of children the food could have fed.

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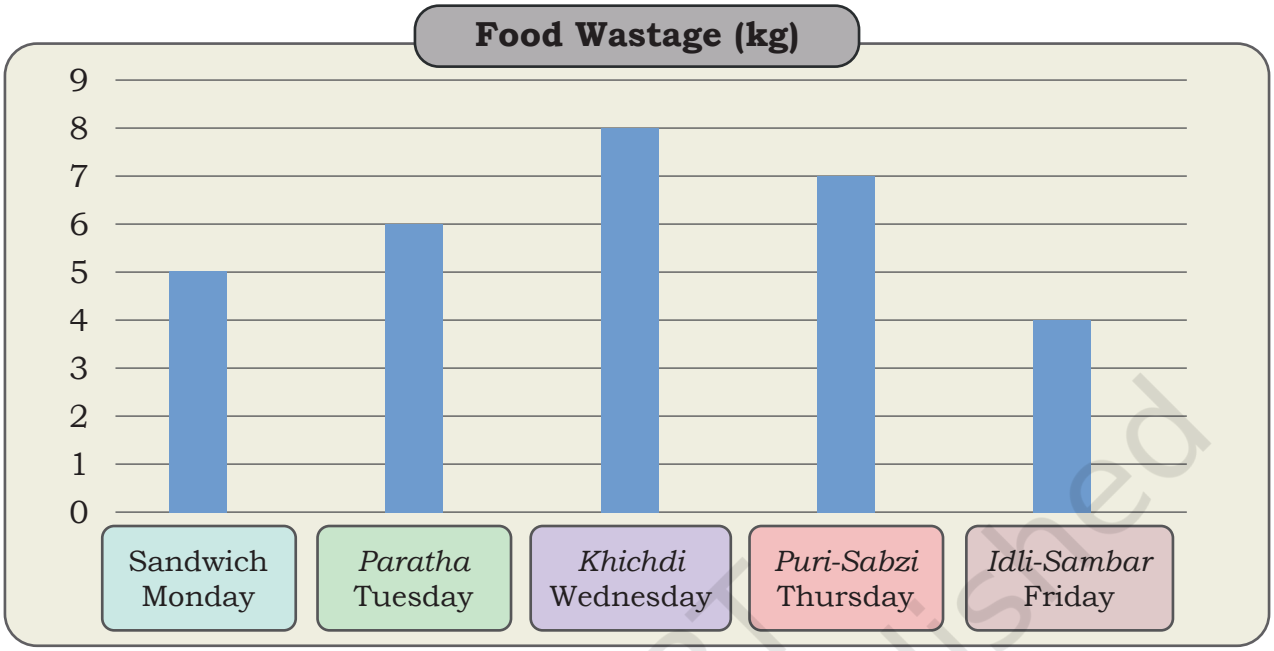
Given below is the data collected over the weekdays for different food items.



Rani was shocked to see the data. What do you think about food wastage? How can we reduce the wastage of food? What can we do with the leftover food?

Observe the above graph and answer the following questions.

1. Which food item had the highest amount of wastage? _____
2. Which food item had the least amount of wastage? _____
3. How much total food wastage was recorded in these days? _____
4. If 1 kg of food waste can feed 3 children, how many children could have been fed with the total food wasted? _____
5. _____ day had less food wastage than _____ day.
6. If the same food items are to be repeated next week, can you predict which food item is likely to be wasted the most?

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True or False

Observe the above picture carefully. Based on your observation, find out which of the following statements are true or false.

All girls are wearing glasses. ☐ TRUE ☐ FALSE	10 children are wearing caps on their heads. ☐ TRUE ☐ FALSE
More boys are holding books than girls. ☐ TRUE ☐ FALSE	More than half of the children are wearing glasses. ☐ TRUE ☐ FALSE
The number of children holding books is greater than the number of children wearing caps. ☐ TRUE ☐ FALSE	The number of boys wearing glasses is greater than the number of girls wearing glasses. ☐ TRUE ☐ FALSE
Some children are wearing both glasses and caps. ☐ TRUE ☐ FALSE	There is no child who has all three items— a cap, a book and a backpack. ☐ TRUE ☐ FALSE

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Notes

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Notes

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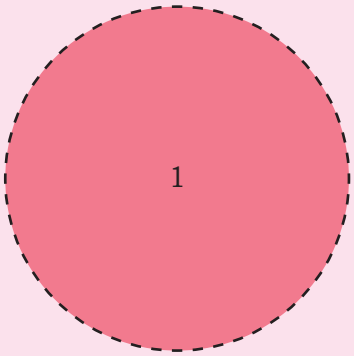
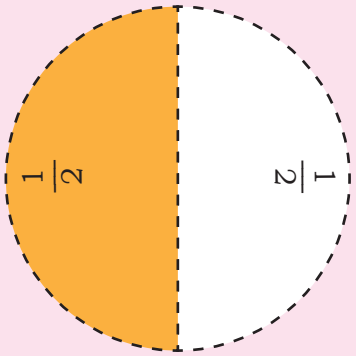
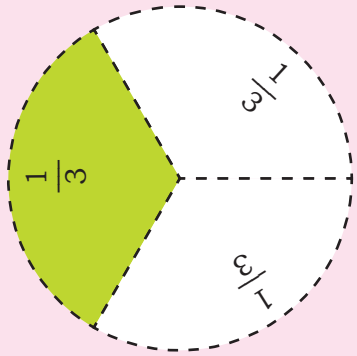
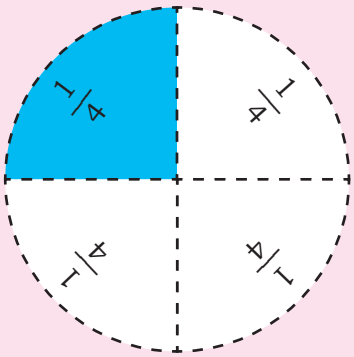
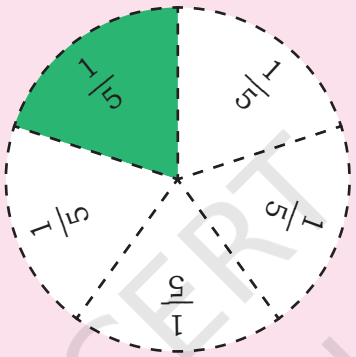
Fractions Kit

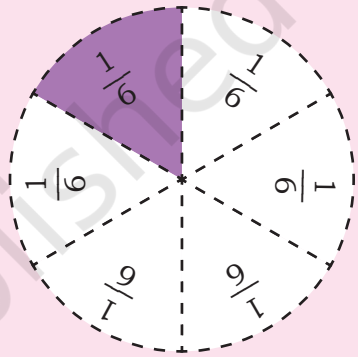


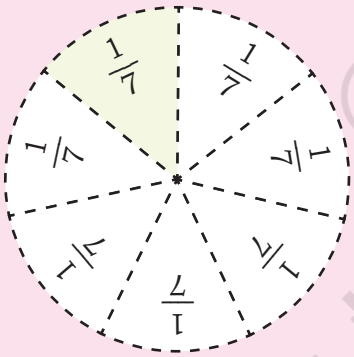


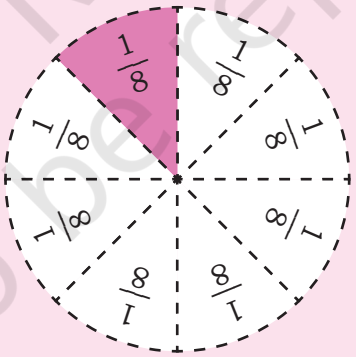


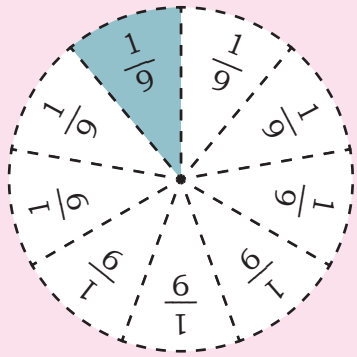


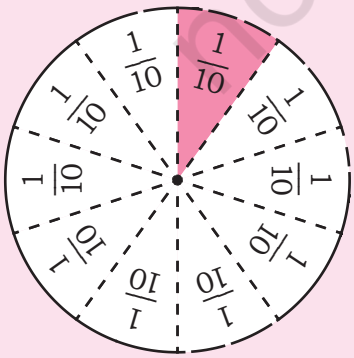


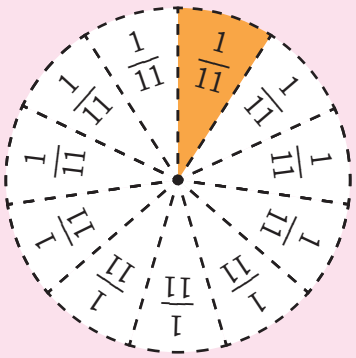


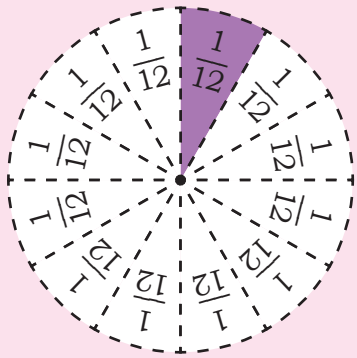












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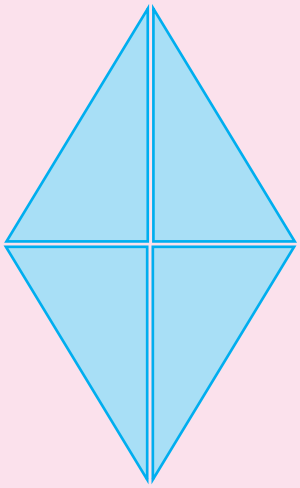
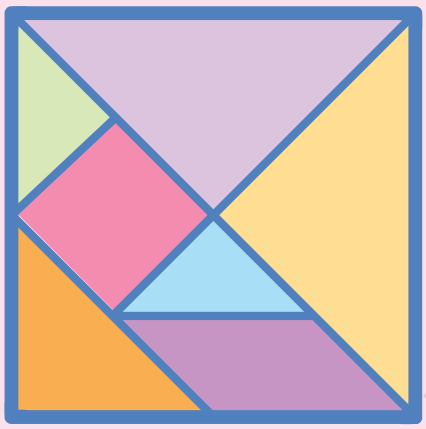
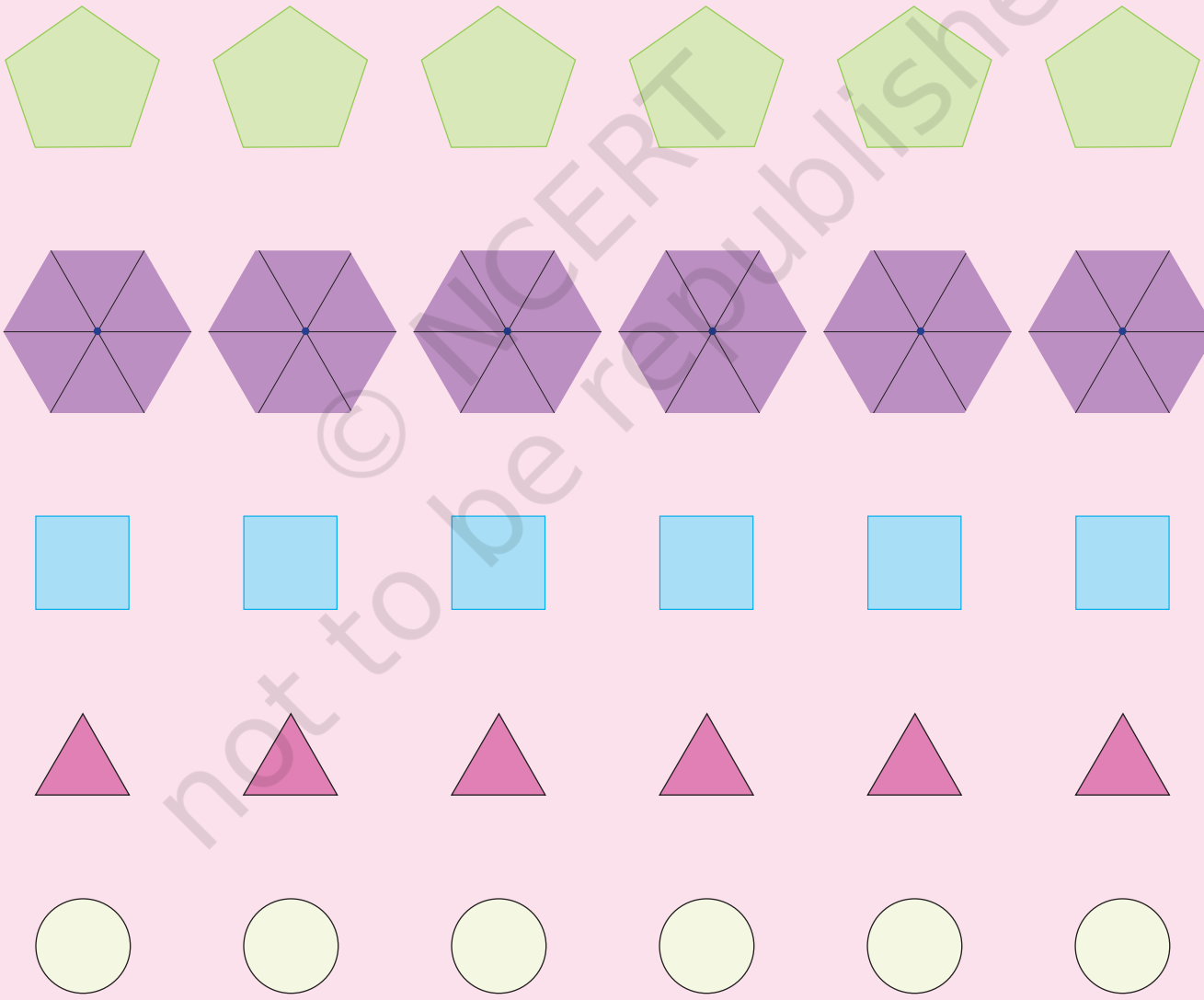
Tessellation and Shapes







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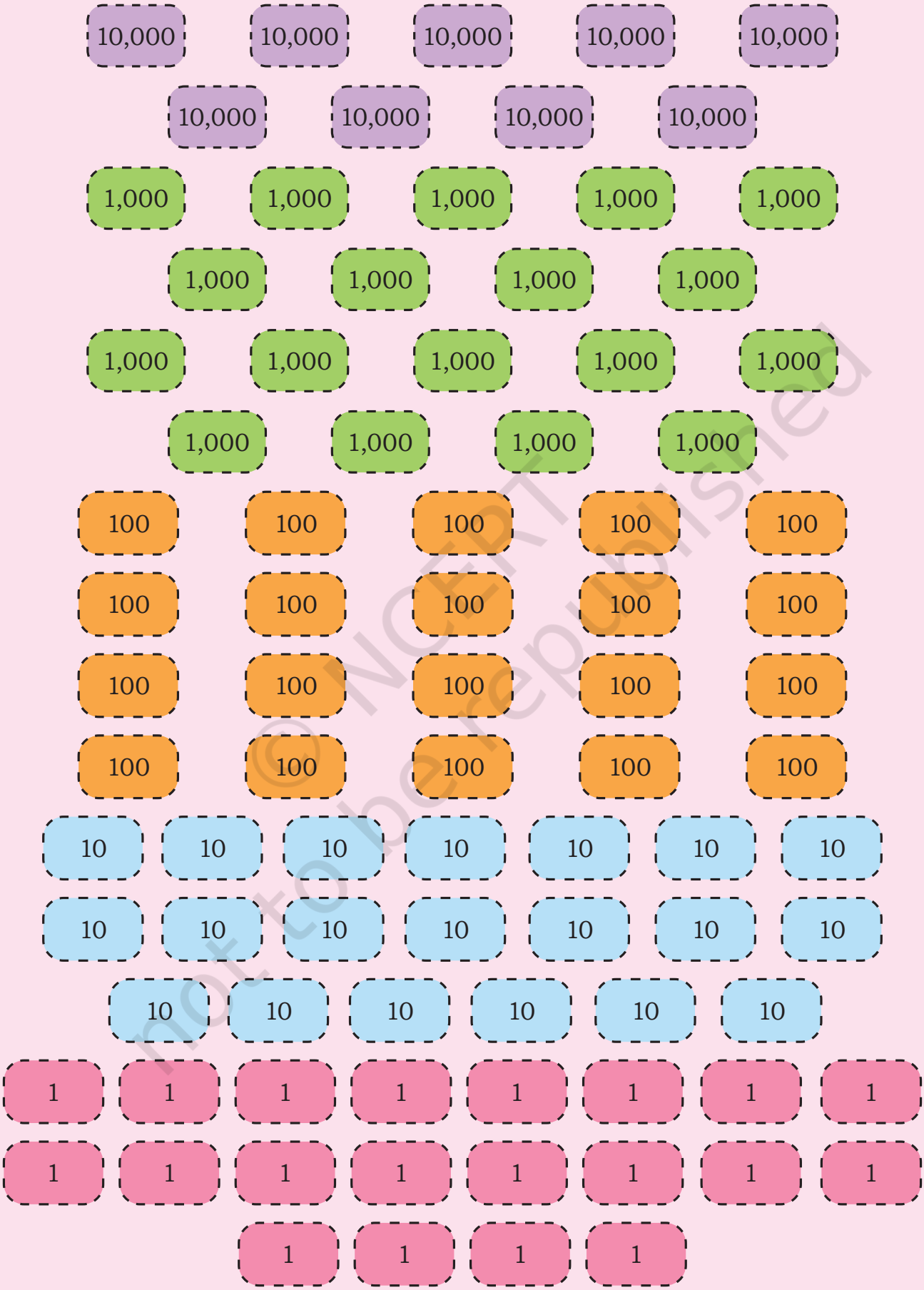
Number Tokens



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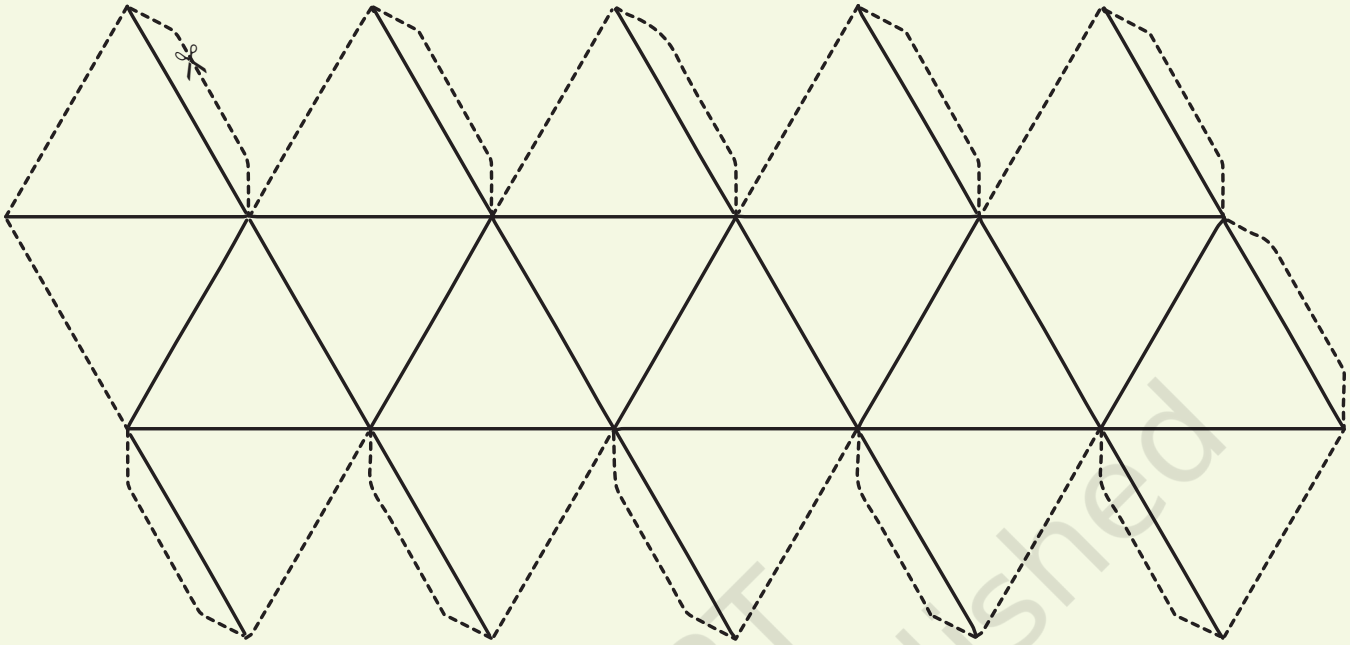
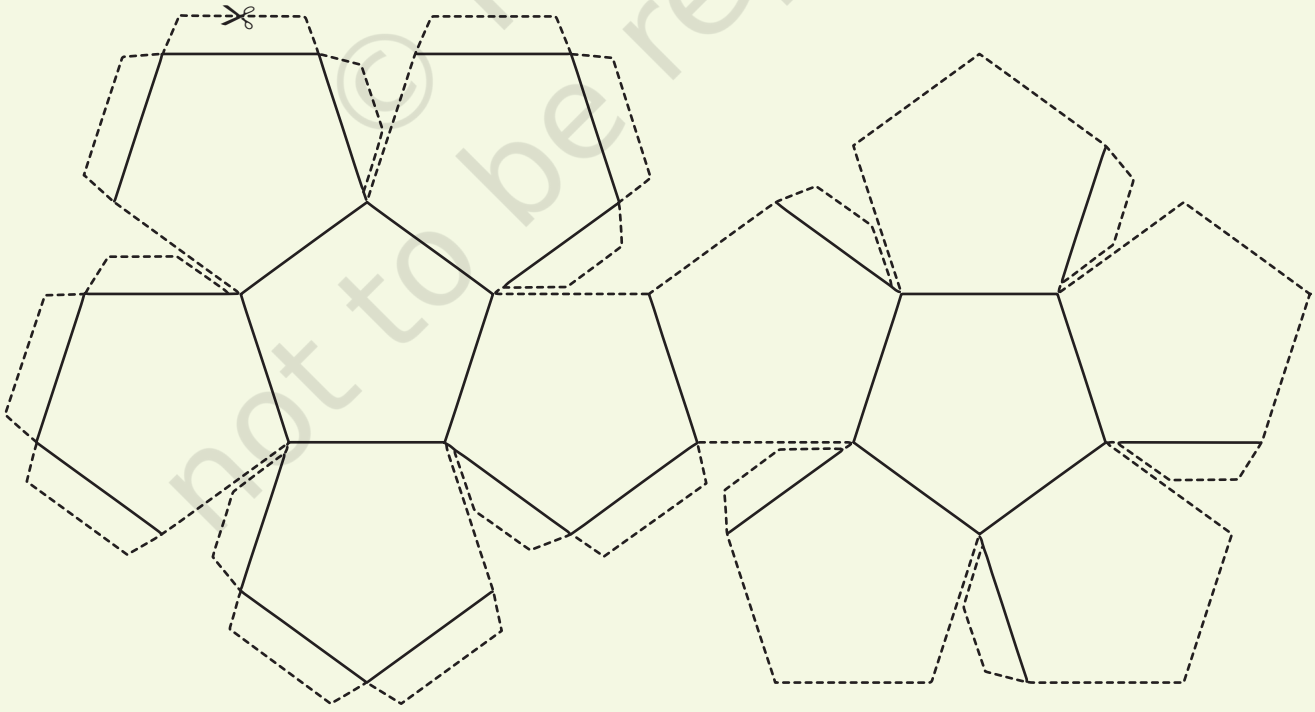
Cut along the dotted lines and fold along the solid lines



Net of a Icosahedron



Net of a Dodecahedron

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